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CONTENTS

Danica Nikolić Vesković PARENT'S ATTACHMENT AND MENTALIZATION AS PREDICTORS OF PARENTING STYLES	7
Gabriella Simonyi THE CONCEPT OF LYING IN THE LANGUAGE USE OF HUNGARIAN ELEMENTARY SCHOOL STUDENTS IN VOJVODINA: AN EMPIRICAL STUDY WITHIN THE FRAMEWORK OF COLEMAN AND KAY (1981)	23
Željko Mladenović THE "CHOICE BLINDNESS" EFFECT: CHALLENGING INTROSPECTION, INTENTION AND CHOICE	37
Vesna Vrhovac, Svetlana Borojević THE EFFECT OF AFFECTIVE PRIMING THROUGH DYNAMIC STIMULI ON RECOGNIZING EMOTIONS	51
Nebojša Milićević, Milica Đorđević THE EXAMINATION OF AESTHETIC EVALUATIONS OF FEMALE PORTRAITS IN PABLO PICASSO'S OEUVRE	67
Nikola Cocić THE MEDIATING ROLE OF LEADER-MEMBER EXCHANGE IN THE RELATIONSHIP BETWEEN ORGANIZATIONAL JUSTICE AND JOB INSECURITY	85
Nikola Goljović DISMANTLING THE HYPE: A SYSTEMATIC REVIEW OF NLP COACHING LIMITED IMPACT IN ORGANIZATIONS	105
Nuša Kovačević Tojnko, Tatjana Rožič FEEDBACK INFORMED SUPERVISION OF PSYCHOTHERAPEUTIC PROCESS MONITORED BY SYNERGETIC-NAVIGATION SYSTEM (CASE STUDY)	121

Parent's Attachment and Mentalization as Predictors of Parenting Styles^{1*}

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Abstract

The aim of this study is to examine whether a tendency towards a certain parenting style can be predicted based on a parent's attachment and mentalization capacity. The study included 122 respondents, 79 female, 43 male, aged from 29 to 54, who were parents of children up to 12 years of age. The data was collected using the following instruments: The Parenting Styles and Dimensions Questionnaire (PSDQ); The Serbian modified and adapted version of the Experiences in Close Relationships questionnaire (SM-ECR-R) and the Mentalization scale (MentS). A regression analysis was applied to test the predictive power of dimensions of attachment and mentalization for each parenting style. The model that explains the variance of authoritative parenting style (23%) contains anxiety and mentalization of others as predictors ($R^2 = .23$, $F(2, 119) = 17.63$, $p < .001$, $\Delta R^2 = .06$, $p = .004$). Lower anxiety ($\beta = -.24$, $t = -2.97$, $p = .004$) and greater capacity for mentalization of others ($\beta = .41$, $t = 5.08$, $p < .001$) contribute to the tendency towards the authoritative parenting style. The model that explains the variance of authoritarian parenting style (22%) contains anxiety, motivation to mentalize and avoidance as predictors ($R^2 = .22$, $F(3, 118) = 10.84$, $p < .001$, $\Delta R^2 = .04$, $p = .029$). Higher anxiety ($\beta = .46$, $t = 5.36$, $p < .001$), lower motivation for mentalization ($\beta = -.26$, $t = -2.98$, $p = .003$), and lower avoidance ($\beta = -.20$, $t = -2.21$, $p = .029$) contribute towards the authoritarian parenting style. The conclusion of the study is that, based on a parent's attachment and mentalization, a tendency towards a certain parenting style can be predicted.

Key words: attachment, mentalization, parenting style, parents

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Parent's Attachment and Mentalization as Predictors of Parenting Styles

The importance of parenting is reflected in the effects it has on the psychosocial development and behaviour of children. The individual characteristics of parents are an important factor in determining parenting. The quality of the emotional relationships that people form with significant caregivers while growing up constitutes an adult's *affective style*, an individual characteristic that can shape the relationships people have with others, including their own children (Ainsworth, 1989; Bowlby, 1973). In this paper, the aspect of parenting, a *parenting style*, is considered from the perspective of *attachment theory*. It is examined whether the dimensions of parents' *attachment* and the development of their *capacity for mentalization* can predict a *parenting style*.

Parenting Style

A *Parenting style* represents the constellation of attitudes and behaviours of parents in their interaction with children and the emotional climate in which parents' behaviour is manifested which influences the process of socialisation, i.e., the psychosocial development and behaviour of children (Darling & Steinberg, 1993; Darling, 1999). In this paper, authors rely on Diana Baumrind's model of *parenting styles*. A *parenting style* encompasses responsiveness, i.e., the emotional warmth and demandingness or control that parents exert over their children (Baumrind, 1966, 1991). Responsiveness refers to the extent to which parents consciously promote children's individuality, self-affirmation and self-regulation through mutual adjustment, acceptance of children and provision of emotional warmth and support. Demandingness or control refers to the demands that parents place on their children in terms of maturity, supervision of children, discipline, and willingness to confront children when they disobey (Baumrind, 1991). A distinction is made between three *parenting styles* depending on the degree of responsiveness and demandingness of parents towards the children: *authoritative*, *authoritarian*, and *permissive parenting styles* (Baumrind, 1966, 1991).

The *authoritative* parenting style is characterised by high responsiveness, emotional warmth, and support as well as high demands adapted to the age of the child (Baumrind, 1991). It involves clear behavioural norms, an assertive approach to children without using coercion and restrictions, while disciplinary measures are more supportive than punitive. It aims to develop children's assertiveness, willingness to co-operate, self-regulation and social responsibility (Baumrind, 1991). Children who grow up in families with an *authoritative* parenting style are self-confident, friendly, achievement-orientated, resilient and can cope well with stress (Baumrind, 1995). An *authoritative* style is associated with better emotion regulation in children and lower levels of behavioural problems, in contrast to an *authoritarian* style

(Haslam et al, 2020; Zubizarreta et al, 2019; Simons & Conger 2007). Adolescents from authoritative families use more adaptive achievement strategies (Aunola et al., 2000), show more engagement in learning and lower levels of depression (Simons & Conger 2007; Zubizarreta, et al., 2019).

In an *authoritarian* parenting style, parents are very demanding and directive, but with low responsiveness and show little emotional warmth. They demand obedience from the children and expect their orders to be obeyed without explanation (Baumrind, 1991). Children who grow up in authoritarian families show conflict-prone behaviour, are moody, hostile towards others and have a low stress tolerance (Baumrind, 1995).

A *permissive* parenting style means a high responsiveness and little control. Permissive parents avoid confrontation, are indulgent and unconventional, do not demand mature behaviour and allow significant self-regulation (Baumrind, 1991). Children of permissive parents show impulsive-aggressive and rebellious behaviour and low achievement (Baumrind, 1995). *Authoritarian* and *permissive* parenting styles are negatively related to academic achievement, whereas an *authoritative* parenting style is positively related to academic achievement (Dornbusch et al., 1987; Matejevic et al., 2014; Yang & Zhao 2020; Józsa et al., 2019).

Attachment Theory

Attachment theory is a theory of personality functioning, intrapsychic structure, and the development of interpersonal behaviour (Mikulincer & Shaver, 2003). It emphasises the importance of the quality of the first emotional bonds between a mother and a child and their impact on the relationships that are formed with others throughout life. *Attachment* represents an innate need and a behavioural system that is reflected in the desire for closeness, belonging and security and has its phylogenetic roots in the maintenance of the species (Bowlby, 1969). The quality of *attachment* develops depending on the mother's responsiveness to the infant's signals, i.e., whether the mother is consistently responsive, constantly unavailable, or occasionally available and unpredictable. The affective bond can therefore be secure or insecure. In a *secure attachment*, the child considers himself as worthy of attention and love and attachment figures as available and supportive. In an *insecure relationship*, the child perceives itself as insufficiently valuable and others as unavailable or only temporarily available. These internal representations of self and parents form an internal working models of self and significant others, which are used to interpret the consequences of one's own behaviour and predict behaviour, thoughts, and feelings of others. Initial affective relationships are thought to be relatively stable throughout life through internal working models and their influence on the formation of later relationships with others, including one's own children (Bowlby, 1973). In addition to the behavioural system of attachment, i.e., the desire for closeness and belonging, there is also a system of care. It is assumed that, like the attachment system, it has its phylogenetic roots in the maintenance of the species and consists of providing

protection, care and concern to offspring and creating the conditions for their growth and development (Bowlby, 1969). It is thought to be complementary to the child's attachment system and manifests in adulthood not only towards children but also in other close relationships. However, the synchronicity between the child's attachment system and the parents' caring system is not guaranteed. Increased activation of the parents' attachment system can reduce the activation of their caring system. Therefore, the affective patterns of parental attachment established in childhood and adolescence may influence the overall quality of parental care (Jones et al., 2015).

Attachment in adulthood is an individual trait defined by characteristic attachment patterns and/or the dimensions underlying these patterns - the dimension of *anxiety* and the dimension of *avoidance*. *Anxiety* refers to the need for approval from other people and the fear of abandonment in relationships with others. *Avoidance* refers to the avoidance of closeness and dependence on other people (Brennan et al., 1998).

Theory and research suggest that secure *attachment* in adulthood, low *avoidance*, and low *anxiety* (positive model of self and positive model of others) are characterized by openness to closeness and intimacy, self-confidence (Griffin & Bartholomew, 1994), general trust in other people and their goodwill, support for others, enjoyment in social interactions, and better emotion control (Mikulincer & Shaver, 2003). *Insecure anxious attachment* (high anxiety, low avoidance; negative model of self, positive model of others) is characterized by preoccupation with one's own attachment needs and the active search for the fulfilment of these needs in close relationships. There is an excessive dependence on others and a search for self-affirmation through the acceptance and approval of others (Griffin & Bartholomew, 1994), reduced capacity to provide help and care to others, an impaired ability to regulate negative emotions, and a tendency to outbursts of anger (Mikulincer & Shaver, 2003). *Insecure avoidant attachment* (high avoidance, low anxiety; positive model of self and negative model of others) is characterized by avoidance of closeness in relationships with others and an emphasis on independence and self-sufficiency (Griffin & Bartholomew, 1994), maintenance of self-esteem by relying only on oneself, avoidance of confronting problems, suppression of expression of emotions, rigidity in thinking, less empathy and less provision of help and care to others, as well as less enjoyment in social interactions (Mikulincer & Shaver, 2003).

Mentalization

Theory and research suggest that *secure attachment* to a caregiver in childhood facilitates the development of *mentalizing capacity* (Fonagy & Allison, 2012) and that there is a positive correlation between *secure attachment* and more developed *mentalizing capacity* (Banjac et al., 2013; Fonagy et al., 1991). *Mentalization* is mental activity by which one interprets one's own behaviour and the behaviour of others through their feelings, needs, desires, beliefs, goals, purposes, and reasons. (Fonagy & Allison, 2012). It develops through constant interaction between the child and the

parent, through interpretation and processing of the child's signals and appropriate emotional responses by parents, so the child is not overwhelmed by emotions and feels safe (Fonagy & Allison, 2012). *Mentalization* facilitates the appreciation of different points of view in interpersonal relationships, better resolution of interpersonal problems (Allen, 2006) and enables greater sensitivity to other people's feelings, desires, and attitudes (Recktenvald & Donelli, 2019). It is associated with better self-control, emotion regulation (Fonagy et al., 1991) and attention (Bateman & Fonagy, 2010) as well as more positive relationships with others (Fonagy & Target, 1997). *Mentalization* allows a person to experience emotionally charged situations without simultaneously being overwhelmed by emotions and hyperactivating or deactivating the attachment system, resulting in more sensitive behaviour (Rostad et al., 2016).

Parents' Attachment and Mentalization Capacity and Characteristics of Parenting

The research (Cohn et al., 1992) indicates that parents with *insecure attachment styles* provided less warmth and structure in their interactions with their children, compared to *securely attached* parents. *Secure attachment* of parents is correlated with an *authoritative* parenting style (Doinita & Maria, 2015), while *anxiously attached* mothers are more inclined to an *authoritarian* and *permissive* parenting style (Kittaka, 2014). *Avoidantly attached* mothers showed a greater tendency towards an *authoritarian* parenting style (Kittaka, 2014). Higher *avoidance* is associated with less responsiveness to children when they are under stress (Edelstein et al., 2004). Parents' *insecure attachment* style is associated with less parental acceptance and care, greater intrusiveness, greater psychological control, and less involvement in activities with children that promote positive development (Jones et al., 2015).

Parental *mentalization*, i.e., understanding the child's behaviour through the child's mental states, enables the parent to react sensitively and appropriately to the child's attachment needs, thus providing him with security (Slade, 2005). When parents understand their child's bad behaviour through emotions and needs that underlie that behaviour, i.e., the mental states, they can react more sensitively to the child's behaviour and prevent instinctive responses that can be harsh and insensitive to the child's basic needs (Rostad et al., 2016). Research has shown that a greater capacity for parental *mentalization* is associated with better quality care (Camoirano, 2017; Suchman et al., 2010) and greater sensitivity towards children (Rosenblum et al., 2008).

Our basic research assumption was that understanding the concept of *parenting styles* through the relationship with *attachment* and *mentalization* can be highly informative. This understanding may contribute to recognizing the possible influence of parents' early emotional experiences and the development of their *capacity for mentalization* on the relationship they have with their own children.

The aim of this study is to examine whether, based on parents' *attachment* and *capacity for mentalization*, it is possible to determine the tendency of parents towards a certain *parenting style*.

We expect that *insecurely attached* (high *anxiety* and/or *avoidance*) parents will show a greater tendency towards an *authoritarian* or *permissive parenting style*, while *securely attached* (low *anxiety* and low *avoidance*) parents will show a greater tendency towards an *authoritative parenting style*. Additionally, we expect that parents with more developed *mentalization capacity* will be more orientated towards the *authoritative parenting style* while parents with lower *capacity for mentalization* will be more orientated towards the *authoritarian* or *permissive parenting style*.

Method

Sample and Procedure

The sample of the survey consists of parents of children younger than 12 years old. The sample is convenient, formed by the snowball technique and includes a total of 122 parents, 79 female and 43 males, aged from 29 to 54 ($M = 41.18$; $SD = 5.160$). When it comes to the level of education it has been shown that 11.5% of respondents have a high school degree, 24.6% bachelor's, 40.2% master's and 23.8% PhD or specialization. The respondents filled out survey questionnaires in electronic form. The questionnaire was e-mailed to a certain number of people in the author's environment, who were then asked to send out the questionnaire to other people from their own environment who fit into the afore-mentioned profile. The respondents were informed that the study was anonymous, voluntary, and that the results would be processed in a group form and used for purposes of science and research, and that they can withdraw from the research at any time.

Measures

The Parenting Styles and Dimensions Questionnaire (PSDQ; Robinson et al., 2001). The questionnaire measures the *authoritarian*, *authoritative* and *permissive style* and is based on Baumrind's model of *parenting styles*. The *authoritarian style* contains three dimensions: coercion (e.g., "I physically punish the child, as a way of discipline"), verbal hostility (e.g., "I yelled at my child when he misbehaved") and non-explanation (e.g., "I punished/ I left my child by taking away his privileges, with little or no explanation"). The *authoritative style* includes the dimensions: connection (e.g., "I talk to my child about his problems"), regulation ("I explained to my child why the rules must be followed") and autonomy (e.g., "I allowed my child to influence the rules in the family"), while the *permissive style* is determined by one dimension (e.g., "It was difficult for me to discipline my child"). In this paper, the total scores of authoritarian and authoritative styles were used, not the subdimensions underlying these styles. The questionnaire consists of 32 items, 12 of which refer to the dimension of the *authoritarian style*, 15 to the

dimension of the *authoritative style*, and 5 to the dimension of the *permissive style*. Respondents answer the questionnaire by assessing their agreement with each item on a five-point Likert-type scale. The degree of agreement ranges from 1 – *never*; 2 – *rarely*; 3 – *occasionally*; 4 – *often*; 5 – *always*. Reliability of subscales in this study was: $\alpha = .81$ for *authoritarian style*, $\alpha = .84$ for *authoritative style* and $\alpha = .44$ for *permissive style*. The subscale of the *permissive style* was excluded from further analyses because of poor reliability.

The Mentalization Scale (MentS; Dimitrijević et al., 2018) examines three dimensions of the *capacity for mentalization: mentalization of one's own states* (e.g., “When I get upset, I’m not sure if I’m sad, afraid, or angry”), *mentalization of others* (e.g., “When I make conclusions about other people’s personality traits I carefully observe what they say and do”), *motivation to mentalize* (e.g., “I find it important to understand reasons for my behavior”), as well as the overall capacity for mentalizing. In this paper, the overall capacity for mentalizing was not used, but only three dimensions underlying the global score. The questionnaire consists of 28 items with which respondents evaluate the degree of agreement using a five-point scale ranging from “1 - *completely false*” to “5 - *completely true*”. The subscale related to the *mentalization of one's own states* consists of 8 items, while the subscales related to the *mentalization of others* and the *motivation for mentalizing* consist of 10 items. Scores are obtained by summing all items in each of the subscales. In this study, the reliability of subscales was: $\alpha = .67$ for *mentalization of self*, $\alpha = .79$ for *mentalization of others* and $\alpha = .74$ for *motivation to mentalize*.

The Serbian Modified and Adapted Version of the Experiences in Close Relationships Questionnaire (SM-ECR-R; Hanak & Dimitrijević, 2013). The questionnaire examines *attachment* and consists of 36 items, half of which refer to the dimension of *avoidance* (e.g., “I prefer not to show how I feel deep down”) and half to the dimension of *anxiety* (e.g., “I’m afraid that I will lose the love of persons with whom I feel close”). Respondents respond by assessing on a seven-point scale the extent to which they agree with each item. The degree of agreement ranges from “1 - *I do not agree at all*; 2 - *I do not agree*; 3 - *I partially disagree*; 4 - *I neither agree nor disagree*; 5 - *I partially agree*; 6 - *I agree*” to “7 - *I completely agree*.” The measures are expressed by the mean value of the answers on each scale and indicate the level of expression of *avoidance* and *anxiety* in relationships with others. Reliability of subscales in this study was: $\alpha = .84$ for *avoidance* and $\alpha = .87$ for *anxiety*.

Results

The results of descriptive statistics are represented in Table 1.

Table 1

Descriptive analysis

Variables	Min.	Max.	Mean	SD	Sk	Ku
Anxiety	1.00	5.56	2.27	0.86	1.10	1.65
Avoidance	1.72	5.83	3.28	0.81	.53	.24
Mentalization	70.00	126.00	104.13	12.01	-.25	-.47
MentS	14.00	40.00	30.24	5.12	-.39	.13
MentO	26.00	50.00	39.70	5.15	.09	-.70
MentM	21.00	49.00	37.90	5.96	-.33	-.38
Authoritative	2.87	5.00	4.40	0.41	-1.23	2.14
Authoritarian	1.33	4.92	2.27	0.51	1.29	4.84

Note: MentS – mentalization of self; MentO – mentalization of others; MentM – motivation to mentalize

Table 2 shows results of Spearman's correlation coefficient test between variables. The correlation of *authoritative* parenting style with dimensions of attachment, *anxiety* and *avoidance* is negative and weak. The correlations of this parenting style with dimensions of mentalization of self and mentalization of others are positive and medium-intensity, while correlation with motivation for mentalization is positive and weak. The *authoritarian* parenting style is positively, medium-intensity, correlated with *anxiety* and has a negative weak correlation with *mentalization of self*. There is a negative medium-intensity correlation between anxiety and mentalization of self. Avoidance is weakly and negatively correlated with mentalization of self, and negatively and medium-intensity with mentalization of others and motivation to mentalize.

Table 2

Correlations between variables

	Anx	Avoid	MentS	MentO	MentM	Authori tative	Authori tarian
Anx		.318**	-.535**	-.054	.089	-.286**	.361**
Avoid			-.295**	-.424**	-.326**	-.278**	.030
MentS				.365**	.160	.344**	-.268**
MentO					.643**	.400**	-.073
MentM						.257**	-.189*
Authoritative							-.071
Authoritarian							

Note: Anx – anxiety; Avoid – avoidance; MentS – mentalization of self; MentO – mentalization of others; MentM – motivation to mentalize; * $p < .05$; ** $p < .01$

The Forward method of regression analysis was conducted to test the predictive power of *attachment* and *mentalization* for each parenting style. The criterion for including variables in a predictive model was if probability of F change is $\leq .050$

Table 3

Prediction model of the authoritative style

	Predictors	β	t	p	Model summary
1.	MentO	.41	4.98	.000	$R = .41, R^2 = .17,$ $F(1, 120) = 24.80$ $p < .001$
2.	Anxiety	-.24	-2.97	.004	$R = .48, R^2 = .23,$
	MentO	.41	5.08	.000	$F(2, 119) = 17.63$ $p < .001, \Delta R^2 = .06,$ $p = .004$

Note: MentO – mentalization of others

Table 3 presents the predictive models of the *authoritative* parenting style. In the first step, the model that contains only mentalization of others as a predictor was established and it explains 17% variance of *authoritative* parenting style. In the second step, the anxiety was included as a predictor establishing the model that gives the best results in this study, and explains 23 % variance of the *authoritative* parenting style. Lower *anxiety* and higher capacity for *mentalization of others* contribute to a greater tendency towards the *authoritative* parenting style, while *mentalization of others* is a more significant predictor.

Table 4

Prediction model of the authoritarian style

	Predictors	β	t	p	Model summary
1.	Anxiety	.38	4.56	.000	$R = .38, R^2 = .15,$ $F(1, 120) = 20.82$ $p < .001$
2.	Anxiety	.41	4.87	.000	$R = .43, R^2 = .18,$
	MentM	-.19	-2.28	.024	$F(2, 119) = 13.38$ $p < .001, \Delta R^2 = .04,$ $p = .024$
3.	Anxiety	.46	5.36	.000	$R = .46, R^2 = .22,$
	MentM	-.26	-2.98	.003	$F(3, 118) = 10.84$
	Avoidance	-.20	-2.21	.029	$p < .001, \Delta R^2 = .04,$ $p = .029$

Note: MentM – motivation to mentalize

Table 4 presents the predictive models of the *authoritarian* parenting style. The first model of prediction of the authoritarian style contains anxiety as a predictor. In

the second step, motivation to mentalize was included and finally, in the third step, the avoidance was included and by that, the best model to predict the authoritarian style, on this sample, was established. This model explains 22% variance of the authoritarian style. Higher *anxiety*, lower *motivation to mentalize* and lower *avoidance* contribute to a greater tendency towards the *authoritarian* parenting style, while *anxiety* is the most significant predictor.

Discussion

The aim of this study was to examine whether a tendency towards a certain *parenting style* can be predicted based on parents' *attachment* and *mentalization*.

The stated research findings, in the light of *Attachment theory*, *Mentalization theory* and *Theory of parenting styles* can be understood as follows. The results show that the attachment dimension, *anxiety* and the *mentalization of others* are significant predictors of an *authoritative* parenting style. Lower *anxiety* and higher *mentalization of others* indicate a greater tendency towards an *authoritative* parenting style and *mentalization of others* has a greater contribution than *anxiety*. Lower *anxiety*, i.e., a lower need for approval and a lower fear of abandonment in relationships with others, as well as a greater capacity of parents to mentalize others' internal states and behaviours, indicate a greater tendency towards an *authoritative* parenting style. On the other hand, the results show that greater *anxiety*, lower *motivation to mentalize* and lower *avoidance* contribute to an *authoritarian* parenting style. These findings are consistent with other studies (Cohn et al., 1992; Doinita & Maria, 2015; Jones et al., 2015) that have found that parents who have a *secure attachment* (low *anxiety* and low *avoidance*) provide more emotional warmth and structure to their children and tend to have an *authoritative* parenting style while *insecure attachment* (high *anxiety* and/or *avoidance*) is associated with *authoritarian* and *permissive* parenting style, less parental acceptance and care, greater intrusiveness, and greater psychological control.

The initial affective relationships we form with our parents in childhood contribute to our relationships with our children in adulthood (Bowlby, 1973). Parents who have low *anxiety* and thus who do not hyperactivate their affective system are able to give their children more responsiveness, warmth and support and make more demands that are appropriate to the children's age, i.e., an *authoritative* parenting style. As their attachment system is not hyperactivated, their caregiving system is not impaired (Jones et al., 2015). A more developed *capacity for mentalization* of others also enables parents to be aware of the nature of mental states and to make efforts to identify the mental states that underlie certain child behaviours. Additionally, a more developed *capacity for mentalization* of others enables parents to experience emotionally charged situations without being overwhelmed by emotions and thus without hyperactivating their attachment system, allowing them to react more sensitively to the child's behaviour (Rostad et al., 2016), which is characteristic of

the *authoritative* parenting style. These findings are consistent with the findings of other research that suggest that mentalizing the child's internal states, understanding the child's behaviour regarding the emotions and needs underlying that behaviour, result in better quality care and greater sensitivity towards the children (Camoirano, 2017; Suchman et al., 2010; Rosenblum et al., 2008), which is a characteristic of the *authoritative* parenting style.

Greater parents' *anxiety*, less *avoidance* and less *motivation to mentalize* contribute to an *authoritarian* parenting style characterised by less emotional warmth, responsiveness, and support. Higher *anxiety* and thus hyperactivation of a parent's attachment system, preoccupation with one's own attachment needs reduces the capacity to provide help and care to children (Mikulincer & Shaver, 2003). Parents' reduced *motivation to mentalize* their own thoughts, emotions, and behaviours and those of the child can also lead them to view the child as an object and thus display controlling and coercive behaviour towards the child (Allen, 2006), which is characteristic of the *authoritarian* parenting style. Without mentalizing the child's inner states, parents may react instinctively and be harsh and insensitive to the child's basic needs (Rostad et al., 2016). Parents' lower *motivation to mentalize* prevents them from taking the child's point of view (Allen, 2006), making them less sensitive to the child's feelings, desires, and attitudes (Recktenvald & Donelli, 2019).

Limitations

There are some limitations of this study. The sample was non-random and unequal by gender. Moreover, the education of the participants is not representative for the population since a large percentage of the participants have a PhD or specialization. The permissive style subscale had poor reliability and was excluded from the analyses, so we only examined two parenting styles. More comprehensive data could be obtained with instruments that distinguish a larger number of parenting styles. Furthermore, we did not analyse dimensions underlying *authoritative* and *authoritarian* parenting style.

Conclusions and Recommendations

We can conclude that *mentalization of others* and *anxiety* are significant predictors of the *authoritative* parenting style while *anxiety*, *motivation to mentalize* and *avoidance* are significant predictors of the *authoritarian* parenting style. Lower *anxiety*, lower preoccupation with one's own attachment needs and sense of security, and a greater *ability to mentalize* the child's internal states and behaviour contribute to a greater tendency for parents to adopt the *authoritative* parenting style, which is characterized with greater responsiveness, emotional warmth, support and demands

appropriate to the child's age. Higher *anxiety*, preoccupation with one's own attachment needs, lower *avoidance* and lower *motivation to mentalize* the child's internal states and behaviour contribute to a greater tendency of parents towards the *authoritarian* parenting style which implies less responsiveness, emotional support, and higher control, directiveness and demands from the child without explanation.

Based on the results of this study, it is possible to develop interventions to help parents explore their inner reasons for a preference for a particular parenting style. It is also possible to develop interventions that would strengthen parents' *ability to mentalize*, especially to *mentalize others*, and help them to adopt the *authoritative* parenting style.

The obtained findings provide a good basis for further research. It is recommended to explore dimensions underlying *authoritative* and *authoritarian* parenting styles. In addition, more comprehensive data could be obtained by analysing children's *attachment* as well as *parenting styles*, not only from the parents' perspective but also from their children's perspective.

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Afektivna vezanost i mentalizacija roditelja kao prediktor vaspitnih stilova

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Apstrakt

Cilj ove studije je da ispita da li se na osnovu afektivne vezanosti i kapaciteta za mentalizaciju roditelja može predvideti sklonost roditelja ka određenom vaspitnom stilu. Istraživanjem su obuhvaćena 122 ispitanika, 79 žena, 43 muškarca, starosti od 29 do 54 godina, koji su roditelji dece do 12 godina starosti. Podaci su prikupljeni korišćenjem sledećih instrumenata: Upitnik stilova i dimenzija roditeljstva (PSDQ); upitnik Iskustvo u bliskim odnosima, modifikovana i prilagođena verzija na srpskom jeziku (SM-ECR-R) i Upitnik za ispitivanje mentalizacije (MentS). Regresiona analiza je primenjena da bi se testirala prediktivna moć dimenzija afektivne vezanosti i mentalizacije za svaki vaspitni stil. Model koji objašnjava varijansu autoritativnog vaspitnog stila (23%) sadrži anksioznost i mentalizaciju drugih kao prediktore ($R^2 = .23$, $F(2, 119) = 17.63$, $p < .001$, $\Delta R^2 = .06$, $p = .004$). Manja anksioznost ($\beta = -.24$, $t = -2.97$, $p = .004$) i veći kapacitet za mentalizaciju drugih ($\beta = .41$, $t = 5.08$, $p < .001$) doprinosi sklonosti ka autoritativnom vaspitnom stilu. Model koji objašnjava varijansu autoritarnog vaspitnog stila (22%) sadrži anksioznost, motivaciju za mentalizaciju i izbegavanje kao prediktore ($R^2 = .22$, $F(3, 118) = 10.84$, $p < .001$, $\Delta R^2 = .04$, $p = .029$). Veća anksioznost ($\beta = .46$, $t = 5.36$, $p < .001$), niža motivacija za mentalizaciju ($\beta = -.26$, $t = -2.98$, $p = .003$), i niže izbegavanje ($\beta = -.20$, $t = -2.21$, $p = .029$) doprinose autoritarnom vaspitnom stilu. Zaključak studije je da se na osnovu afektivne vezanosti i mentalizacije roditelja može predvideti sklonost ka određenom vaspitnom stilu.

Cljučne reči: afektivna vezanost, mentalizacija, vaspitni stil, roditelji

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The Concept of Lying in the Language Use of Hungarian Elementary School Students in Vojvodina: An Empirical Study Within the Framework of Coleman and Kay (1981)^{1*}

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Abstract

This study examines the concept of lying among Hungarian-speaking elementary school students in Vojvodina, focusing on the relative importance of the three prototypical elements of lying: objective falsehood, belief in the falsehood, and intention to deceive. Following the methodology of Coleman and Kay (1981), we used a Hungarian translation of their stories, ensuring cultural appropriateness. Participants ($N=256$) completed an online questionnaire, rating each story's prototypicality of lying. Regarding the characteristics of the sample, the gender composition was balanced, with the proportion of female participants being 47.5% and male participants 52.5%. The age of the participants ranged from 11 to 15 years, with an average age of $M = 12.08$ years. Results indicate that the sequence of lying elements, in order of importance, is objective falsehood > belief in the falsehood > intention to deceive. This contrasts with Coleman and Kay's original sequence, suggesting potential cultural differences in the perception of lying. The findings also indicate that belief in the falsehood plays a more significant role than intention to deceive among Hungarian-speaking students in Vojvodina. This study contributes to the knowledge of how elements of lying are prioritized in different languages and cultural contexts."

Keywords: lying, perception, Hungarian-speaking students in Vojvodina

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The Concept of Lying in the Language Use of Hungarian Elementary School Students in Vojvodina: An Empirical Study Within the Framework of Coleman and Kay (1981)

The aim of the research is to understand the concept of lying and its prototypical elements in the language use of Hungarian students in Vojvodina. The researchers sought to explore how these elements are perceived and ranked by the students, and how this differs or aligns with previous research findings from other cultures. Additionally, we discussed our results in the light of previous findings obtained on the Hungarian sample from Hungary that speak the same language but come from different cultural backgrounds, as studied by Vajtai (2013). Vojvodina is a multiethnic region where the diverse cultural influences affecting individuals are undeniable. We discussed our results in light of previous findings obtained from samples that speak the same language but come from different cultural backgrounds. This research is an integral, though smaller part, of a larger study focused on adolescent lying. Researching lying in this manner has educational relevance because, according to well-established findings from psychological studies, lying in childhood is positively associated with a wide range of other problematic behaviors, such as disruptive conduct, aggression, conduct disorders, theft, truancy, or criminal behavior (Gervais et al., 2000; Gervais et al., 1998; Rutter et al., 1970; Stewart & DeBlois, 1985; Stouthamer-Loeber & Loeber, 1986). Moreover, longitudinal studies show that lying at an early age plays a predictive role in criminal behavior or drug use in adolescence and adulthood (Pulkkinen, 1983).

Theoretical Background

Lying is a constant factor in our everyday lives because it holds socially adaptive significance. No one wants to hurt their relative, old friend, especially if they approach us with good intentions. At the same time, lying is generally considered antisocial behavior (Bok, 1989); despite moral condemnation, it remains common behavior among adults, used as a social strategy to achieve interpersonal goals, manage and maintain relationships (DePaulo & Kashy, 1998). However, for some people, it becomes a maladaptive strategy that ultimately damages their relationships.

Lying is a statement that does not correspond to reality. In addition, for an untrue statement to be considered as a lie, it must have two other very important characteristics (Talwar & Lee, 2011). One is that it must be conscious, meaning that the person making the statement must be aware that their statement does not align with the facts; otherwise, they are not lying but mistaken. The other characteristic of a lie is that it is always motivated by some interest. Those who lie consciously seek to deceive others, and their statement, which distorts reality, is intended to gain some benefit, which cannot be enjoyed if the truth is revealed. According to DePaulo and Kashy (1998), both the intention to deceive and the deception itself must be present in

intentional deception. Similarly, Walczyk, et al. (2014) emphasize the deceptive intent, stating that lying means intentionally misleading others into believing something that the liar knows is not true. Coleman and Kay (1981) introduced a prototype semantic analysis of the term “lie” in English. They proposed that a prototypical lie consists of three elements: (a) the statement (P) is false, (b) the speaker (S) believes P to be false, and (c) in uttering P, S intends to deceive the listener (A). This means that a prototypical lie involves a deliberate falsehood intended to deceive. Their findings indicated that English speakers consider the second element, false belief, to be the most crucial for defining a prototypical lie (a), followed by the intent to deceive (b) and lastly, the objective falsehood (c). Experiments conducted by Coleman and Kay were replicated with native speakers of several languages, yielding both similar and differing results across cultures, e.g., Arabic (Cole 1996), Hungarian (Vajtai, 2013, Falyuna 2016) Ecuadorian Spanish (Hardin, 2010), Indonesian (Adha, 2020). While Arabic and Ecuadorian Spanish speakers evaluated lying similarly to English speakers, adhering to the belief > intention > falsehood hierarchy, Adha (2020) discovered that for native Indonesian speakers, the prototypical concept of lying proposed by Coleman and Kay (1981) does not hold. In Indonesian culture, the most crucial element of a lie is factual falsehood, followed by the intent to deceive, with the belief component not necessarily being part of the concept of lying. Regarding Hungarian native speakers, Vajtai (2013) carried out Coleman and Kay’s (1981) experiment with the participation of 57 people. Although Vajtai did not definitively rule out that the concept of a lie is the same for Hungarian language users as for English and Ecuadorian Spanish language users, i.e. it contains all three prototypical elements proposed by Coleman and Kay (1981), with faith being the strongest, but he still came to the conclusion found that in the case of Hungarian native speakers, the main element in judging whether a statement is judged to be a lie or not in a given situation is the intention to deceive. Falyuna - like Vajtai - also places the intention to deceive first in the concept of a lie, followed by false statements and then awareness. This order is not surprising, since Falyuna (2016) treats lying as a subtype of deception. According to Vajtai (2013) and Falyuna (2016), for Hungarian language users, the intention to deceive plays the most important role in the concept of a lie, ahead of the belief in falsehood.

Research question and Hypothesis

The research questions for the experiment reported here on were as follows:

1. What is the sequence of elements of lying among Hungarian-speaking students in Vojvodina, in terms of importance as shown by the perception of lying, assumed by Coleman and Kay (1981)? 2. Is the intent to deceive the most important element of a lie in the language usage of Hungarian students in Vojvodina, similarly to the language usage of Hungarians from Hungary, as assumed by Vajtai (2013) and Falyuna (2016).

Method

Sample and Procedure

The sample for data collection consisted of a total of 256 participants who were surveyed in June and July 2022 using an anonymous online questionnaire on the Google Forms platform, primarily in the northern part of Vojvodina. The research was conducted online in the Hungarian language. Participation was voluntary and anonymous. Ethical approval for data collection was obtained from their parents/legal guardians. The link to the questionnaire was given to the students by their teachers. We present the background variables of the sample elements, which provided valid responses to the control questions Regarding the characteristics of the sample, the gender composition was balanced, with the proportion of female participants being 47.5% and male participants 52.5%. The age of the participants ranged from 11 to 15 years, with an average age of $M = 12.08$ years.

Measures

Our questionnaire follows the methodology defined by Coleman & Kay (1981). The authors created eight stories in which they combined the three elements of a prototypical lie: (a) objective falsehood, (b) belief in the falsehood, and (c) intention to deceive. Table 1 shows the combinations of these three elements appearing in the eight stories. In the table, a “+” sign indicates that the element is present in the respective story, while a “-” sign indicates its absence. The stories themselves can be found in the Appendix, with the table showing the names of the main characters in each story and the keywords necessary to recall the story.

Table 1

Combinations of the elements of a prototypical lie in the stories of Coleman and Kay (1981)

Story	Objective falsehood	Belief in the falsehood	Intention to deceive
1. Moe-cake	+	+	+
2. John-golf	-	-	-
3. Pigfat-swimming pool	+	-	+
4. Katerina-math test	-	+	+
5. Schmallowitz-dinner	+	+	-
6. Mary-ex-boyfriend	-	-	+
7. Nurse Braine-appendicitis	+	-	-
8. Superfan-food poisoning	-	+	-

In our research, we used the Hungarian translation by Vajtai (2013) of the stories formulated by Coleman and Kay (1981), who ensured that the linguistic formulation

of the stories would be culturally acceptable to Hungarian native speakers. He replaced the original English names in the stories with Hungarian names. The stories can be found in the appendix.

After reading each story in the experiment, the participants had to answer two questions in the same way as in the original Coleman and Kay (1981) experiment, in order to determine the degree of judgment of the lie and the certainty of the judgment. The first question aimed to determine whether the main character in the story lied or not, while the second question asked how certain the participant was in their answer to the first question.

Data Analysis

For data analysis, we used the same 7-point scale as suggested by Coleman and Kay (1981). The scores were determined by combining the responses to the two questions mentioned above. For example, if a participant was completely sure that the main character in the story lied, then we assigned 7 points, meaning that 7 points indicate that the story contains a prototypical lie according to the participant's judgment. If the participant was fairly certain that the main character lied in the story, they received 6 points. Finally, if the participant was not really sure if the character lied, we assigned 5 points. If the participant could not decide whether the character lied or not, we did not consider their response to the certainty question and gave 4 points. A respondent received 3 points if they were not really sure that the character did not lie, and 2 points if they were fairly certain. Finally, those respondents who were completely sure that the main character did not lie in a story received 1 point. Stories judged in this way contained the least prototypical lie. The average score was calculated for each story by adding the scores assigned to the validly responding participants and dividing by the number of validly responding participants. Table 2 shows the possible answers and their scores.

Table 2

The possible answers and their score in the questionnaire

Did he/she/it lie?	In my answer:	Score
Lied	I'm absolutely sure	7
Lied	I'm fairly sure	6
Lied	I'm not really sure	5
I can't decide	I'm absolutely sure	4
I can't decide	I'm fairly sure	4
I can't decide	I'm not really sure	4
He/she/it didn't lie	I'm not really sure	3
He/she/it didn't lie	I'm fairly sure	2
He/she/it didn't lie	I'm absolutely sure	1

The tests for valid response were similar to the original Coleman and Kay (1981) experiment for the 1st and 2nd stories. The expected answer for the 1st story was that yes, Máté lied, while for the 2nd story it was no, János did not lie. In fact, the 1st and 2nd stories functioned as control stories. If a participant did not respond as expected to either or both of these, we excluded them from the analysis, and their responses were not considered for the other stories. Out of the 446 respondents, we excluded the responses of 190 individuals and considered the responses of 256 individuals.

The data collected from the 256 respondents were analyzed using several statistical techniques to ensure the robustness and validity of the findings. Initially, descriptive statistics were calculated to obtain the mean scores, standard deviations, and standard errors for each story, which provided a foundational understanding of how the participants perceived each scenario in terms of lying. To determine the relationships between the elements of lying and the mean scores of the stories, we conducted correlation analyses. Specifically, we examined the correlation coefficients for the presence of each lying element (objective falsehood, belief in falsehood, and intention to deceive) against the mean scores. Furthermore, we performed ANOVA (Analysis of Variance) to assess the differences between the means of the scores across the different stories. This technique allowed us to identify statistically significant variations in perceptions of lying among the stories presented. Post-hoc analyses, specifically Tukey's HSD (Honestly Significant Difference), were utilized to determine which specific pairs of stories differed significantly from each other.

Results

The scores from 256 respondents were added up and then divided by 256 to obtain the average score for each story. Table 3 shows the degree to which Hungarian speaking students in Vojvodina considered each of Coleman & Kay's stories to contain a lie, with 7 being the perfect prototypical lie score. The scores in bold (with mean score ranging from 3.18 to 3.68) in the table mean that the respondents could not determine with certainty whether the stories contain either stronger or weaker lie.

Table 3

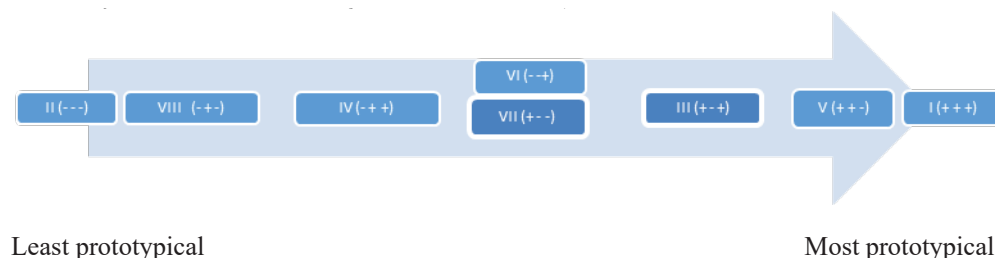
Results

Story	Element*	<i>M</i>	<i>SD</i>	<i>SE</i>
I. Cake	(+ + +)	6.84	.41	.03
II. Chess	(- - -)	1.25	0.53	.03
III. Video game	(+ - +)	4.56	2.27	.14
IV. Math test	(- + +)	3.68	2.34	.15
V. Dinner	(+ + -)	5.42	1.94	.12
VI. Sick ex-boyfriend	(- - +)	4.53	2.36	.15
VII. Surgery	(+ - -)	4.53	2.24	.14
VIII. Football match	(- + -)	3.18	2.14	.13

* Column shows the combinations of the three elements of the prototypical lie in the eight stories. In the table, the + sign indicates the presence of the respective element in the story, while the - sign indicates its absence (objective falsehood, belief in falsehood, intent to deceive).

Story IV and VIII are almost in the middle of lie-values, meaning that Hungarians in Vojvodina are not certain whether the character was lying or not. IV and VIII stories do not have the element of falsehood, and also have the element of belief, the only difference is in third element Figure 1 shows stories ranked in ascending order where the one containing least prototypical example of a lie is on the left and the most prototypical example of a lie is on the right.

Figure 1
Order of mean scale scores (from non-lie to lie)



Coleman and Kay (1981) stated that a story consisting of fewer elements would be the least prototypical lie. However, in table 3, the VII story, which contains only one element, the element of objective falsehood, is closer to the most prototypical lie than the IV story, which contains two elements but no element of objective falsehood. Moreover, the stories containing the element of objective falsehood have higher average scale scores than the most prototypical story in which this element is absent ($r = .71, p = .05$). Table 4 displays the correlation between the mean scores of the stories and the presence of the elements in them, However, the story with only the belief element (VIII Story) is positioned lower on the continuum than the stories with the falsehood (VII Story) or intention elements (VI. Story).

Table 4
The correlation between the mean scores of the stories and the presence of the elements in them

Mean	Element	<i>r</i>	<i>p</i>
Mean (M)	Objective falsehood	.71	.05
Mean (M)	Belief in the falsehood	.35	.40
Mean (M)	Intention to deceive	.43	.29

Based on the results of Coleman and Kay (1981), if a story contains only one of the three components of lying or two of them, it is considered a weaker lie than if all three components are present. Accordingly, in Figure 1, the lie containing less than three prototypical elements should approach the left end of the lie-value scale, indicating that it should be considered less of a lie.

Comparing objective falsehood and belief in the falsehood, we can say that the 7th story (+ - -) has the same value (4.53) as the 6th story (- - +) (4.53), suggesting that

objective falsehood is equal to intention to deceive: objective falsehood = *intention to deceive*. The 3rd story (+ - +) (4.56) and the 4th story (- + +) (3.68) show that the objective falsehood is more important than the belief: objective falsehood > belief.

In comparing the other elements of lying, when comparing objective falsehood and intention to deceive, as we said, the 7th story (+ - -) (4.53) has the same value as the 6th story (- - +) (4.53), indicating that the element of objective falsehood is as strong as the element of intention to deceive. When comparing the two stories with the two prototypical elements of lying, we see that the 5th story (+ + -) has a higher average score (5.45) than the 4th story (- + +) (3.68), indicating that the element of objective falsehood is stronger than the element of intention to deceive. Overall, based on our study, it seems that among the three elements of lying, objective falsehood is the strongest.

For the hypothesis which aimed to determine whether the most important element of lying in the language use of Hungarian students in Vojvodina is the intention to deceive, as a first step, we compared the average scores of the 7th story (+ - -) (4.53), which is higher (by 1.35 points) than that of the 8th story (- + -) (3.18). This suggests that for the Hungarian-speaking students in Vojvodina, the objective falsehood plays a more important role in the concept of lying than the belief in the falsehood.

In the second step of the comparison, we get similar results. However, the difference between the average scores of the 5th story (+ + -) (5.42) and the 3rd story (+ - +) (4.56) is 0.86. Based on all these, it can be concluded that for our participants, the belief in the falsehood proved to be stronger than the intention to deceive, with objective falsehood being the strongest element in the concept of lying.

The results were calculated by performing ANOVA and Tukey's HSD analysis, where the *p* values confirm that the differences described above are statistically significant (Table 5 and Table 6).

Table 5

ANOVA analysis results

Index	Sum of squares	Degrees of freedom	<i>F</i>	<i>p</i>
C (Story)	4797.66	7	182.73	.00

Table 6

Tukey HSD analysis results

Story 1	Story 2	Mean difference	<i>p</i>
I. Cake	II. Chess	-5.59	.00
I. Cake	III. Video game	-2.39	.00
I. Cake	IV. Math test	-3.17	.00
I. Cake	V. Dinner	-1.43	.00
I. Cake	VI. Sick ex-boyfriend	-2.31	.00
I. Cake	VII. Surgery	-2.32	.00
I. Cake	VIII. Football match	-3.66	.00

II. Chess	III. Video game	3.20	.00
II. Chess	IV. Math test	2.42	.00
II. Chess	V. Dinner	4.16	.00
II. Chess	VI. Sick ex-boyfriend	3.28	.00
II. Chess	VII. Surgery	3.27	.00
II. Chess	VIII. Football match	1.93	.00
III. Video game	IV. Math test	-.78	.00
III. Video game	V. Dinner	.96	.00
III. Video game	VI. Sick ex-boyfriend	.07	.99
III. Video game	VII. Surgery	.07	.99
III. Video game	VIII. Football match	-1.28	.00
IV. Math test	V. Dinner	1.74	.00
IV. Math test	VI. Sick ex-boyfriend	.86	.00
IV. Math test	VII. Surgery	.85	.00
IV. Math test	VIII. Football match	-.50	.07
V. Dinner	VI. Sick ex-boyfriend	-.89	.00
V. Dinner	VII. Surgery	-.89	.00
V. Dinner	VIII. Football match	-2.24	.00
VI. Sick ex-boyfriend	VII. Surgery	-.00	1.00
VI. Sick ex-boyfriend	VIII. Football match	-1.35	.00
VII. Surgery	VIII. Football match	-1.34	.00

Discussion

The aim of our study was to replicate the experiment of Coleman and Kay (1981) in order to answer our formulated research questions. These were as follows:

1. What is the sequence of elements of lying assumed by Hungarian-speaking students in Vojvodina in terms of importance as shown by Coleman and Kay (1981)?

2. Is the intent to deceive the most important element of a lie in the language usage of Hungarian students in Vojvodina, similarly to the language usage of Hungarians from Hungary, as assumed by Vajtai (2013) and Falyuna (2016)? Based on our results, a combined answer can be given to the two research questions. The sequence of the three prototypical elements of lying assumed by Coleman and Kay (1981) is: belief in the falsehood > intention to deceive > objective falsehood. The same sequence was shown in experiments repeated with Arabic speakers (Cole, 1996) and Ecuadorian Spanish speakers (Hardin, 2010) and in this case the most important, in Hungarian speakers from Hungary (Vajtai, 2013). According to the current study, the sequence of lying elements for Hungarian students from Vojvodina is as follows: objective falsehood > belief in the falsehood > intention to deceive. This order does not match the order established by Coleman and Kay (1981) based on judgments of English speakers, nor does it align with the work of Vajtai (2013), which replicated the study in Hungarian and revealed the structure belief > intent > falsity. In Adha's (2020) study with Indonesians, the most crucial element of a lie

is factual falsehood too, but it is followed by the intent to deceive, with the belief component not necessarily being part of the concept of lying. It can be said that from the sequence, it is evident that for our participants, belief in the falsehood proved to be stronger than the intention to deceive, and objective falsehood is the strongest element in the concept of lying. Additionally, Sakaba (2020) cites the work of Yoshimura (1995), who found that the conceptual prototype for the Japanese term “uso” is falsity > belief > intent. This last finding corresponds with our results. The differences in the ordering of these elements may stem from cultural and linguistic factors that shape how lying is conceptualized in different contexts. For instance, Hungarian students might prioritize the objective falsehood due to cultural norms emphasizing factual accuracy over the intent behind a statement. In contrast, English speakers might focus more on the belief and intent, reflecting different societal values around communication and trust. These variations highlight the importance of context in understanding the concept of lying. Recognizing that different cultures may interpret and prioritize elements of lying differently can lead to a more nuanced understanding of how language influences perceptions of honesty and deception.

Conclusion

Based on our research, we conclude that the interpretation of lying among Hungarian students in Vojvodina differs from that of Hungarians in Hungary, particularly regarding the importance of the elements of lying. The results indicate that, among the Hungarian speakers in Vojvodina, objective falsehood is prioritized over belief in the falsehood and intention to deceive. This difference is particularly noteworthy given that previous studies, such as those by Coleman and Kay (1981) and Vajtai (2013), suggested that belief and intention might hold greater significance. The cultural and linguistic environment in Vojvodina likely influences the conceptualization of lying, thereby affecting the prioritization of its elements. Our future research aims to gain a deeper understanding of these differences. By comparing the Hungarian sample in Vojvodina with Serbian and Croatian samples, we can explore how local cultural influences shape perceptions of lying. This comparative analysis will help us gain a more nuanced understanding of how cultural norms and societal values affect communication and trust among different ethnic groups. This research contributes to the understanding of the complexity of lying and the role of culture, especially in multilingual and multicultural contexts. Recognizing that individuals from diverse linguistic and cultural backgrounds interpret the elements of lying differently can provide new perspectives on the discourse surrounding communication and ethical norms. However, the study does have its limitations. For instance, the sample size may restrict the generalizability of the findings, and the cross-sectional design limits our ability to assess changes over time. Furthermore, reliance on self-reported data may introduce biases regarding students’ understanding of honesty and dishonesty.

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Koncepti laži u jezičkoj upotrebi mađarskih učenika osnovnih škola u Vojvodini: empirijska studija u okviru Koulman i Kej (1981)

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Apstrakt

Ova studija ispituje koncept laganja među mađarskim govornicima u osnovnim školama u Vojvodini, fokusirajući se na relativnu važnost tri prototipična elementa laganja: objektivna laž, verovanje u laž i namera da se prevari. Prateći metodologiju Colemana i Kaya (1981), koristili smo mađarski prevod njihovih priča, osiguravajući kulturnu prikladnost. Učesnici (N = 256) su popunili online upitnik, ocenjujući prototipičnost laganja svake priče. Što se tiče karakteristika uzorka, polna struktura je bila izbalansirana, sa udelom učesnica od 47,5% i učesnika od 52,5%. Uzrast učesnika kretao se od 11 do 15 godina, sa prosečnom starošću M = 12,08 godina. Rezultati ukazuju da je redosled elemenata laganja, po važnosti, objektivna laž > verovanje u laž > namera da se prevari. Ovo je u suprotnosti sa originalnim redosledom Colemana i Kaya, što sugerise potencijalne kulturne razlike u percepciji laganja. Takođe, nalazi ukazuju da verovanje u laž igra značajniju ulogu od namere da se prevari među mađarskim govornicima u Vojvodini. Ova studija dopunjuje znanje o tome kako se u različitim jezicima i kulturnom kontekstu prioritetizuju elementi laganja.

Cljučne reči: laganje, percepcija, kulturne razlike: mađarski govornici u Vojvodini

Appendix

1.Hungarian translations of Coleman and Kay's (1981: 31–32) stories in Vajtai's (2013: 12–13) experiment:

- 1) Máté megette a tortát, amit Júlia a vendégek számára sütött. Júlia megkérdezi Mátét: Te etted meg a tortát? Máté azt feleli: Nem. Hazudott Máté?
- 2) Dávid, János és Ádám épp golfoznak. Ádám rálép Dávid labdájára. Mikor Dávid odaér és észreveszi, hogy a labdája bele van nyomva a tőzegbe, azt kérdezi: János, te léptél rá a labdámra? János azt feleli: Nem, Ádám volt. Hazudott János?
- 3) Patrik abban a hitben van, hogy el kell mennie a cukorka bolt előtt ahhoz, hogy eljusson a billiárd szalonhoz, de téved, mert a cukorka bolt elköltözött. Patrik anyja nem szereti a billiárdot. Ahogy Patrik el akarja hagyni a házat, hogy billiárdozni menjen, Patrik anyja megállítja és megkérdezi, hogy hova megy. Patrik azt mondja: A cukorka bolt felé megyek. Hazudott Patrik?
- 4) Egyik reggel Katalinnak aritmetika vizsgája van, amire nem tanult és úgy dönt, hogy nem akar iskolába menni. Azt mondja az anyjának: Beteg

- vagyok. Az anyja megméri a lázát és Katalin meglepetésére kiderül, hogy valóban beteg; aznap később kijön rajta a kanyaró. Hazudott Katalin?
- 5) Sándor hivatalos egy vacsorára a főnökénél. A komor vacsora után – amit senki sem élvezett – Sándor azt mondja a háziasszonynak: Köszönöm, remek parti volt. Sándor persze egyáltalán nem gondolja komolyan, hogy óriási volt a parti és nem is erőlködik bárkit is meggyőzni arról, hogy jól érezte magát, de úgy érzi, valami kedveset kell mondania a főnöke feleségének, attól eltekintve, hogy egyáltalán nem várja el, hogy elhiggye. Hazudott Sándor?
- 6) József és Mária nem rég kezdtek el járni. Vilmos Mária ex-barátja. Egyik este József megkérdezi Máriától: Láttad Vilmost a héten? Mária azt válaszolja: Vilmos mononukleózissal (Pfeiffer-féle mirigy-láz vagy csókbetegség) gyengélkedik két hete. Vilmos valóban ebben a betegségben szenved két hete, de az a helyzet, hogy Máriának előző este randevúja volt Vilmostal. Hazudott Mária?
- 7) Két páciens arra vár, hogy betolják őket a műtőbe. A doktor rámutat az egyikre és azt kérdezi: Géza vakbélműtétre vár vagy mandulaeltávolításra? Betti nővér épp akkor olvassa a kórlapot. Bár nagyon igyekszik példás munkát végezni, a nővér véletlenül összekeveri a betegeket és azt feleli: Vakbélműtétre. Valójában szegény Géza mandulaeltávolításra vár. Hazudott Betti nővér?
- 8) Miklósnak vannak jegyei a bajnokságra és nagyon büszke rájuk. Megmutatja a főnökének, aki azt mondja: Nézd, Miklós, ha előfordul, hogy valamelyik nap kimaradsz a munkából, ajánlom, hogy jobb kifogásod legyen, mint ez a bajnokság. Miklós azt mondja: Rendben, főnök. A meccs napján Miklós betelefonál a munkahelyére: Ma nem tudok bemenni, főnök, mert nagyon beteg vagyok. Miklós a meccsre sem tud elmenni, mert a reggel érzett enyhe hasfájásáról kiderül, hogy ételmérgezés. Hazudott Miklós?

2. The stories from Coleman and Kay's (1981: 31–32) experiment

- 1) Moe has eaten the cake Juliet was intending to serve to company. Juliet asks Moe, 'Did you eat the cake?' Moe says, 'No.' Did Moe lie?
- 2) Dick, John, and H.R. are playing golf. H.R. steps on Dick's ball. When Dick arrives and sees his ball mashed into the turf, he says, 'John, did you step on my ball?' John replies, 'No, H.R. did it.' Did John lie?
- 3) Pigfat believes he has to pass the candy store to get to the pool hall, but he is wrong about this because the candy store has moved. Pigfat's mother doesn't approve of pool. As he is going out the door intending to go to the pool hall, Pigfat's mother asks him where he is going. He says, 'I am going by the candy store.' Did Pigfat lie?
- 4) One morning Katerina has an arithmetic test she hasn't studied for, and so she doesn't want to go to school. She says to her mother, 'I'm sick.' Her

- mother takes her temperature, and it turns out to Katerina's surprise that she really is sick, later that day developing the measles. Did Katerina lie?
- 5) Schmallowitz is invited to dinner at his boss's house. After a dismal evening enjoyed by no one, Schmallowitz says to his hostess, 'Thanks, it was a terrific party.' Schmallowitz doesn't believe it was a terrific party, and he really isn't trying to convince anyone he had a good time, but is just concerned to say something nice to his boss's wife, regardless of the fact that he doesn't expect her to believe it. Did Schmallowitz lie?
 - 6) John and Mary have recently started going together. Valentino is Mary's ex-boyfriend. One evening John asks Mary, 'Have you seen Valentino this week?' Mary answers, 'Valentino's been sick with mononucleosis for the past two weeks.' Valentino has in fact been sick with mononucleosis for the past two weeks, but it is also the case that Mary had a date with Valentino the night before. Did Mary lie?
 - 7) Two patients are waiting to be wheeled into the operating room. The doctor points to one and says, 'Is Jones here the appendectomy or the tonsillectomy?' Nurse Braine has just read the charts. Although she is anxious to keep her job, she has nevertheless confused the charts in her mind and replies, 'The appendectomy,' when in fact poor Jones is the one scheduled for tonsillectomy. Did Nurse Braine lie?
 - 8) Superfan has got tickets for the championship game and is very proud of them. He shows them to his boss, who says, 'Listen, Superfan, any day you don't come to work, you better have a better excuse than that.' Superfan says, 'I will.' On the day of the game, Superfan calls in and says, 'I can't come to work today, Boss, because I'm sick.' Ironically, Superfan doesn't get to go to the game because the slight stomachache he felt on arising turns out to be ptomaine poisoning. So Superfan was really sick when he said he was. Did Superfan lie?

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The “Choice Blindness” Effect: Challenging Introspection, Intention and Choice¹

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Abstract

The “Choice blindness” is the term Johansson et al. introduced in order to name an experimental situation in which participants do not notice that their intended choice is mismatched with the alternative they did not choose; nevertheless, they introspectively derived and offered reasons for their manipulated choices. The “Choice blindness” effect has several important features, such as not noticing the replacement of the selected object, confabulation and change in preference, which should be addressed in an attempt to explain it. The established effect proved to be robust and was replicated in numerous studies in which objections to previous studies and offered explanations were addressed. In order to explain the effect, the researchers referred to insufficient introspection and the blindness of the decision processes, as well as the underestimation of the influence of environmental and situational factors. At present there is no explanation or consensus about mechanisms behind the observed effect. The research method introduced by Johansson et al. represents a valuable tool for exploring the field of psychology of perception and cognitive psychology, and even clinical psychology and attitude research. However, there are still a lot of questions about the “Choice blindness” which should be answered.

Key words: choice blindness, change blindness, introspection

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The “Choice Blindness” Effect: Challenging Introspection, Intention and Choice

There are numerous methodological controversies in psychology and philosophy about the possibility of knowing oneself. Introspection, as a method for getting information about “inner” processes of perceiving, emotions or decision-making, was among those concepts that generated the most controversy in the history of psychology and philosophy of mind. In everyday conversations we hear people giving explanations for choices they made and things they were doing by mentioning reasons or motives which governed their behavior. However, we could cast doubt on these introspective reports, and wonder whether they are true. Nisbett and Wilson (1977) proposed a paradigm for testing hypotheses about the reliability of introspective reports, and they concluded that our introspections are confabulatory. Although their results raised great interest, almost no new experimental research of the subject emerged for almost thirty years. In an attempt to experimentally explore the confabulatory nature of introspection, Johansson et al. (2005) found an interesting phenomenon that they named the “Choice blindness” effect. The results showed that the respondents were ready to explain the choices they did not actually make by offering confabulatory reasons. The results of this first research did not only show the confabulatory nature of introspection, but also provided new insight into the process of choosing and decision-making and inspired numerous new research studies that, in addition to theoretical significance, also have practical implications, e.g., in marketing, judiciary, public opinion polling, political opinions etc.

In this paper we intended to describe the “Choice blindness” effect and the research paradigm by which it was discovered, we tried to present development of the concept, replication and additional research, its robustness and relationship with other (similar) phenomena, as well as possible explanations. This kind of presentation of previous research should provide the interested reader with comprehensive initial insight into current knowledge about the “Choice blindness” effect.

The papers reviewed here were collected from the databases: Google Scholar, PsychInfo and Web of Science (WoS). The “Choice blindness” effect, together with variations and truncations, was the sole search term. The studies were included if they met one or more of the following criteria: (1) the “Choice blindness” effect was the primary topic of the research or review; (2) the possible explanations of the “Choice blindness” effect are given; (3) the research examines the relationship of the “Choice blindness” with other similar phenomena or personality traits; (4) the variant of “Choice blindness” experimental paradigm was used in the study; (5) factors that impact the “Choice blindness” effect were investigated. After the papers were selected using the aforementioned criteria, the results, conclusions and explanations stated in them were organized according to the topics reflected by the subheadings of the following sections in order to present as many aspects of the “Choice blindness” effect as needed.

The “Choice Blindness” Effect

Johansson et al. (2005) investigated the relation between intention, choice, and introspection. They wanted to examine the basic assumption of the theories of decision-making that people detect mismatches between their intentions and following outcomes, and consequently, adjust their behavior in case of discrepancies between intended and achieved outcomes. In their experiment they showed pairs of photographs of female faces to participants and asked them to choose which face in each pair they found the most attractive. Faces in pairs were rated on similarity in preliminary investigation by different subjects and there were two sets of faces: high similarity and low similarity set. There were three choice conditions: one with 2s of deliberation time, one with 5s, and one where participants could take as much time as they needed. In other words, the respondents had 2s, 5s, or unlimited time at their disposal to observe and choose the face that they found more attractive. Unknown to the participants, experimenters manipulated the relationship between choice and outcome that they experienced, by substituting the elected photograph with the unelected using a “Double card ploy”. The “Double card ploy” is a kind of a magic trick, in which the subject chooses one of the two shown cards and then the experimenter places both cards face down on the table and slides the chosen card towards the subject and hands it to him. However, the subject does not know and in most cases cannot see that the experimenter actually slides two cards that are on top of each other; the bottom card is the one the subject chose, and the top one is the one the subject did not choose (the cards in the experimenter’s other hand are arranged oppositely). The subject takes the upper card that the experimenter slides to him, and the lower one remains lying on the table covered by the experimenter’s hand. By returning the hands, the experimenter also returns the card that remained lying on the table, covered with the palm of his hand, and it slides over the edge of the table into the experimenter’s lap. The back of the card is the same color as the table mat on which the trick is performed, in order to reduce the possibility of the subject noticing the substitution. In the described way, the subject ends up with the alternative he did not choose.

Participants were asked to elaborate the choices they made. Results showed that most of the participants (the replacement was noticed in 13% of trials, and in 27% of trials within free deliberation time and low similarity set) failed to notice mismatches between their intended choice and the outcome they were presented with. Participants were also offering introspectively derived reasons for their choices. Introspective reports which participants gave in matching and non-matching conditions were analyzed along three dimensions: Emotionality, Specificity, and Certainty (using a numeric scale from 1 to 5). The results showed that there were no differences between matching and non-matching situations in mentioned dimensions. The introspective reports were confabulatory in case of non-matching outcome. This is an interesting finding since giving confabulatory reports is a common symptom of some forms of dementia and could also be seen

in people with surgically removed connections between brain hemispheres. The authors named this effect “Choice blindness”.

Johansson et al. (2006) further explored the relationship between “Choice blindness” and introspection. They used word-frequency and latent semantic analysis (LSA) to investigate a corpus of introspective reports collected within the “Choice blindness” paradigm by Johansson et al. (2013). The overall methodological approach was the same as in the previously-mentioned experiment (Johansson et al., 2005); participants were shown pairs of photographs of female faces in order to choose which face in each pair was more attractive (Johansson et al., 2013). Face pairs varied in discrepancy of attractiveness, but an attempt was made to keep similarity constant at an intermediate level (faces were clearly different, but not markedly). There were a series of 15 face-pairs per participant, with 4 s for the decision-making process. Six of the pairs were designated as verbal report-pairs, and any three of these six would be manipulated for each participant. There were eighty participants in the study so there were 480 reports collected. Manipulated trials were detected in 27.5% of the cases (Johansson et al., 2013; Johansson et al., 2006). The authors contrasted the introspective reports given in non-manipulated to manipulated trials in: uncertainty, specificity, emotionality, deceit (linguistic markers of deceit and lying), and complexity, but there was no significant difference in semantic content between the non-manipulated and manipulated reports. Reports given by participants were also analyzed with LSA (Latent Semantic Analysis). Statistical analysis of the semantic space showed that the participants justify their choice using the same semantic content for both the non-manipulated and manipulated trials (Johansson et al., 2006).

Challenging and Defending the Concept of “Choice Blindness”

Moore and Haggard (2006) disputed most of the Johansson et al. (2006) conclusions, and wondered if it is the case that all our self-reports (and especially those concerning “real” choices) are detached from reality and confabulatory by nature. Instead, Moore and Haggard referred to an important feature of voluntary action called “agency”. The term agency, according to Moore and Haggard (2006, p. 693), refers to “the ability to interact with the environment through self-generated action. Agency involves specific neural processes, their physical consequences in the environment, and also a characteristic conscious experience of action control.” Moore and Haggard think that “Choice blindness” is an aberrant case in which the states subjects introspect on (in this particular case motivations for action) are artificially made fallible, and because the sources of fallibility are removed, the internal information, one has about his own agency, is more reliable and more valid. Furthermore, they noted that in experiments conducted by Johansson et al. (2006), the choice that was made was actually unimportant to the respondents, given that it is unlikely that people profoundly care about face attractiveness. Therefore,

Johansson’s et al. subjects could make sense of the trick situation in one of two ways. They could either accept that the action that they made had no desired effect and they would thus accept failed agency or they could confabulate new reasons for their action, which would retrospectively turn their action successful. Because the “Choice blindness” experiment situation is artificial, Moore and Haggard conclude that confabulation is an easier method of “sense-making” than accepting failed agency. They suggested that convincing disproof of above criticism would be a demonstration of the “Choice blindness” effect for decisions regarding moral issues; these decisions are presumably less fallible and more resistant to confabulation (Moore & Haggard, 2006). Moreover, participants should justify choices that are of a more important nature, because another key issue is the experimenter-participant dynamic. The participants might suspect a mismatch between their intention and its effects, but they are unwilling to admit these to the experimenter. It would be much harder for the participants to justify choices that are more important, or if participants were given some evidence that their intentions will sometimes miscarry.

As Moore and Haggard (2006) noted, we should differentiate access to one’s reasons for performing an action, and access to the sense of agency itself (including intentions, authorship, conscious will, and so on); the “Choice blindness” apparently is the member of the former class of cases, where one has the task to introspect on the reasons for a choice, not on the process of choosing itself.

Hall et al. (2006) replied to all the objections raised by Moore and Haggard (2006), suggesting that mentioned authors misunderstood some key issues concerning the “Choice blindness” research paradigm and basic results obtained by using it. According to Hall et al., a particularly inadequate argument presented by Moore and Haggard is the one that applies to the artificiality of the “Choice blindness” research paradigm. One could ask whether it is possible to examine anything under severely controlled conditions (e.g., with certainty and without bias) and not to make such conditions artificial?

In another study, Hall et al. (2010) “replied” to the commentary concerning the artificiality of the “Choice blindness” paradigm by extending it to decisions made in more naturalistic settings. In this study, the tasting venue was not in the laboratory but at the local supermarket. They invited passerby shoppers to taste two different varieties of jam and to smell two different varieties of tea, and to decide which alternative in each pair they preferred the most. Immediately after the participants had made their choice, they were asked to sample the chosen alternative again, and to give an explanation for the choice they made. At this point, the contents of the sample containers were secretly switched, so that the outcome of the choice became the opposite of what the participants intended. The results showed that participants detected “33.3% of the manipulated jam trials, and 32.2% of the manipulated tea trials”, thus demonstrating considerable levels of “Choice blindness” for the taste and smell as well as for face attractiveness (Hall et al., 2010, p. 5). The effect “survived” even for such extremely different jams as spicy cinnamon apple vs. bitter grapefruit, or for the smell of teas like sweet mango vs. liquorice pernod, where less than a fifth of the manipulation trials was detected concurrently (and less than half counting all forms of detection).

“Choice Blindness” versus “Change Blindness”

A well-informed reader could, at this point, reasonably ask: is there any difference (or connection) between “Choice blindness” and “Change blindness” which is a well-established phenomenon? The most important finding in numerous experiments concerning “change blindness” is that the participants fail to detect changes in a scene when the change is accompanied by some other visual impediment. If there were no interruptions in the visual stream, changes which occurred in the scene would have been detected instantaneously. Experiments of this kind deepened our apprehension of the visual system functioning (especially attention mechanisms), although exact mechanisms have not yet been agreed upon (see Rensink et al., 1997; Rensink et al., 2000; Rensink, 2000; Simons, 2000; Tse et. al., 2003).

Johansson and Hall (2008) conducted three experiments in order to examine the relationship between “Choice blindness” and “Change blindness”; the authors varied both the stimuli used and the choice procedure. They used abstract patterns in the first experiment, and pictures of female faces in the second and third experiment. In all three experiments, the majority of the manipulations remained undetected, indicating that “Choice blindness” is a robust phenomenon. In these experiments, unlike previous instances, photographs were presented on the computer screen and program-controlled switching of the chosen photograph with the un-chosen one (Johansson & Hall, 2008). First two experiments showed a result pattern similar to the previous experiments, but in Experiment 3, experimenters left the faces on the screen until participants made an attractiveness rating. In this experiment, the detection rate rose to 39%, which differs significantly from the first two experiments. This difference could be interpreted as an indicator that the pictures were not fully processed after the switch in Experiment 1 and 2. A more likely reason, as authors suggested, is that the participants were allowed to look at both pictures, so they had the opportunity for making explicit comparison when they first rated the manipulated photograph and then the initially preferred picture. The authors excluded the possibility that participants noticed the switch and did not report it, because post-experimental interviews with the participants that did not notice any manipulations during the experiment showed that 85% of them believed that they would have detected such a switch if it had been performed. When the authors revealed the actual purpose of the experiment to the participants, they showed considerable surprise, and sometimes even questioned experimenters’ claim that the pictures were switched.

Johansson and Hall (2008) suggested that an important difference between “Change blindness” and “Choice blindness” studies is that the latter employ quite a radical change – that is a full identity switch, although this is not completely true since there are change blindness studies with full identity switch (e.g., Angelone et al., 2003). Although a description of the “Choice blindness” experiment somewhat differs from that of standard “change blindness” experiments, this does not necessarily mean that the mechanisms differ. “Change blindness” explanations usually include some kind of mechanism for “erasing” or “overwriting” of contents

in visual short-term memory (Rensink, 2002), but these explanations were not called upon in the case of “Choice blindness” by the creators of this research paradigm. They do not assume that the intention to choose something is instantly forgotten by the participants. The main purpose of our intentions is to guide our actions. But, if this was the case, as Johansson and Hall (2008) suggested, how can the participants in their study intend to choose X, and then 1500 minutes later fail to notice when they ended up with Y?

Lind et al. (2009) further examined the relationship between intention and action using verbal material, because it is widely accepted that speech production is initiated and guided by clear pre-verbal intentions. These intentions are supposed to function as a standard against which actual performance can be measured in terms of its accuracy. The authors tried to investigate the role of auditory feedback of one’s own voice in the understanding of the meaning of self-produced speech. Participants performed a computerized variant of the Stroop test while hearing their own voice exclusively through earphones, and three of their utterances were covertly recorded. These words were then played back to them over the headphones while they were involved in a different trial of the test, which created a situation where the participants could hear themselves saying something different than what they actually said (i.e., they exchanged what participants said for something they had said earlier). This was essentially a similar situation to the one in “Choice blindness” experiments previously-described, but participants had much greater control of their actions and overall situation. Contrary to results obtained in previous studies of “Choice blindness”, results of these experiments showed that described manipulations were almost always retrospectively detected. Additionally, the majority of the participants reported that they had experienced significant confusion as to the actual source of the manipulated feedback, and not being certain if it was produced by themselves or not. Additionally, on a minority of manipulated trials, participants accepted manipulated feedback as if it was self-produced. These results definitely indicate that there is a limit in the possibility of manipulating with one’s intentions and their outcomes, which depends on the amount of one’s involvement in some action; choosing a preferred photograph from a given pair is something quite different from verbalizing our thoughts or naming a color we see.

Robustness of the “Choice Blindness” Effect

The “Choice blindness” effect has been reproduced in many different ways since its discovery and thus proven to be a very robust phenomenon, which occurs under a variety of test conditions. As previously shown, the type of used material and its presentation varied: printed pictures in live interaction (Johansson et al., 2005; Johansson et al., 2006), computer presentation (Johansson & Hall, 2008), and virtual agents (Johansson et al., 2007). Experiments were carried out in laboratory conditions or in more natural ecologically valid conditions such as supermarkets

(Hallet et al., 2010). The effect is also demonstrated in different sensory modalities: vision (for example: Johansson et al., 2005; Johansson et al., 2006), audition (Lind et al., 2014; Sauerl and et al., 2013), taste and smell (Hall et al., 2010), and touch (Steenfeldt-Kristensen & Thornton, 2013). A computerized version of the “Choice blindness” paradigm with registering pupil dilation and eye-movement patterns as the psychophysiological correlates showed differences between detected and non-detected trials indicating that detection is registered in the cognitive system as a differentiable event (Pärnamets et al., 2023).

The “Choice blindness” effect is established in diverse types of judgments from aesthetic: attractiveness of abstract patterns and male and female faces (Johansson et al., 2005; Johansson et al., 2006; Johansson & Hall, 2008), fragrance and deliciousness (Hallet et al., 2010), up to moral judgments in political debate (Hall et al., 2012; 2013; Rieznik et al., 2017), decision-making during voting (Hall et al., 2013; Strandberg et al., 2018), legal decisions (Sauerland et al., 2013), observer testimony (Cochran et al., 2018), financial decision-making (McLaughlin & Somerville, 2013), and even in the clinical domain by researching the problem of feigning (Merkelbach et al., 2011). With the aim of examining the possible impact of increased awareness on the “Choice blindness” effect, one study involved people who practice meditation and it was expected that mindfulness meditators should be better in noticing the ploy and the mismatch (Lachaud et al. 2022). The results showed higher likelihood of detecting manipulations in the mindful group (experienced mindfulness meditators) compared to the control group (naive to mindfulness meditation), due to “better introspective access and control of reasoning processes acquired during practice and not by the latent characteristics that are attributed to the mindfulness trait” (Lachaud et al. 2022, p. 1607).

Previous research on factors that can have an impact on the “Choice blindness” effect occurrence confirmed that alternatives similitude (Hall et al., 2010; Sauerland et al., 2013), and familiarity (Hall et al., 2012), as well as choice complexity (McLaughlin & Somerville, 2013) are important. Perception of false feedback in a visual task of the “Choice blindness” effect is increased by positive emotions (Huangfu et al., 2019). On the other hand, the influence of social desirability (Aardema et al., 2014), and compliance (Sauerland et al., 2013) is not confirmed.

It is also quite reliably established that respondents consistently change preferences with their own erroneous attributions, since altered feedback is processed and integrated in the following decision processes (Hall et al., 2010; Pärnamets et al., 2020). Later memories and preferences are thus affected (Johansson et al., 2013; Pärnamets et al., 2015; Strandberg et al., 2018).

Attempts to Explain the “Choice Blindness” Effect

The “Choice blindness” effect has several important features, such as not noticing the replacement of the selected object, confabulation after being faced with an alternative they did not choose, and change in preference, which should

be addressed in an attempt to explain it. The key question is why participants do not notice the replacement of the object they chose previously. In an attempt to answer this question, researchers referred to insufficient introspection (Bortolotti & Sullivan-Bissett, 2021; Chen & Risen, 2010; Hall et al., 2013), and the effect was likewise attributed to the blindness of the decision processes, specifically to the non-conscious reasons for our choices (Petitmengin et al., 2013). The underestimation of the influence of environmental (participant’s physical surroundings) and situational factors (general context of the situation in which participant is currently in, e.g., participating in an online experiment) was also taken in consideration as the explanation of the effect (Ariely & Norton, 2008; Hall & Johansson, 2008; Hallet al., 2010; Pärnamets et al., 2015). Respondents’ failure to encode or to attend to the choice options properly is seen as another possible factor for their failing to detect manipulations, but research has shown that this is not the valid explanation (Pärnamets et al., 2015).

Studies on the possible role of working memory in “Choice blindness” did not provide unequivocal explanations. For instance, variation in detection rate cannot be explained by working memory overall capacity (Poorun et al., 2018). However, there were more detections when viewing time of the alternatives during decision-making was unlimited in contrast to the limited time of 2s or 5s (Johansson et al., 2005). Similarly, when more recently perceived alternatives were manipulated, the detection rate of the manipulation was greater (Sauerland et al. 2013). It has been established that participants detect manipulations more likely with the progression of the experiment when manipulations become more frequent, thus indicating increase in their vigilance or decreasing trust in feedback (Taya et al., 2014).

It is interesting to note that the “Choice blindness” effect appears even when participants are informed directly that false feedback will occur and were given the task to detect it. Despite the information that the alternative they chose will in some cases be replaced by the one they did not choose, the respondents failed to notice the mismatch in 24% of cases. A study showed that true and false feedback discriminability, level of activation of the monitoring mechanisms and prior beliefs regarding feedback reliability have an impact on the “Choice blindness” effect emergence (Vogel et al., 2023).

The effect of social interaction between a participant and an experimenter on participant’s withholding to report the detected false feedback was as well considered and examined using a computerized “Choice blindness” task with registering psychophysiological correlates (pupil dilation and eye-movement patterns) with conclusion that these factors differ significantly between detected and non-detected trials so participants’ reception of the manipulation can be taken as it is (Pärnamets et al., 2023).

There were researchers who tried to explain the “Choice blindness” effect by dissonance and a respondent’s lack of motivation to participate in cognitively demanding tasks, but the importance of these factors in the occurrence of the effect has been disproved by results of the recent experiments. Strandberg et al. (2019) conducted a survey of political attitudes in which participants were also asked to

elaborate on some of the answers they gave. Three of these answers were selected and manipulated to indicate an opposite position. The respondents noticed and corrected 58.4% of the manipulations. The extremity, centrality and commitment for each attitude were measured. Preference for consistency, need for cognition and political awareness of the participants were assessed one week prior to the experiment. It has been shown that correction of the manipulations could be predicted only by extremity score. The authors concluded that results brought out the elusiveness of “Choice blindness” and disproved “dissonance and lack of motivation to engage in cognitively demanding tasks as explanations why the effect occurs” (Strandberg et al., 2019, p.2884).

For the time being just a few studies attempted to explore and connect the “Choice blindness” effect with other psychological constructs. For instance, cognitive reflection tests, as a measuring tool for critical thinking, showed individual differences that could predict “Choice blindness” (Strandberg et al., 2018; 2019). Participants with better general analytic skills were shown to be more prone to correct the manipulations in “Choice blindness” setting (Strandberg et al., 2018).

Conclusion

The authors of the concept and research paradigm of “Choice blindness” showed that the vast majority of respondents did not notice that the substitution was made in the experiment, although it is likely that respondents, actually, could have quite reasonable reasons for their preferences in the situation in which they assess which person or template from the given pair is more beautiful (Johansson et al., 2005). The authors never denied that people have very specific intentions in this kind of behavior, but the phenomena such as “Choice blindness” show that this should not be taken for granted in the decision-making tasks. The established effect proved to be robust and was replicated in numerous studies in which objections to previous studies and offered explanations were addressed. As is usually the case in science, new research not only provided answers and deepened our knowledge, but also raised new questions and pointed out new problems. For instance, experiments have shown that manipulations done during the “Choice blindness” effect sometimes have long-lasting effects, given that the following false feedback on initially non-chosen faces ratings increased when participants rated them a second time (Johansson et al., 2013).

Although at present there is no explanation or indication of mechanisms behind the observed effect, we should, according to Johansson (2006), review the concept of intention and reconsider introspection.

The research method introduced by Johansson et al. can be used as a tool for exploring the field of psychology of perception and cognitive psychology, and even in clinical psychology and attitude research, but there are still a lot of questions about the “Choice blindness” which should be answered. The role of instructions given to participants, as well as the degree of their interest for the choosing between given

alternatives in the experiment and the explaining of the involved mechanisms are certainly among the key questions that deserve to be answered.

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Efekat „Slepila izbora“: izazov za introspekciju, nameru i biranje

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Apstrakt

„Slepilo izbora“ je termin koji su Johanson i saradnici uveli kako bi imenovali eksperimentalnu situaciju u kojoj učesnici ne primećuju da je njihov nameravani izbor zamenjen alternativom koju nisu izabrali, ali ipak introspektivno stvaraju i nude razloge za svoje izmanipulisane izbore. Efekat slepila izbora ima nekoliko važnih karakteristika, kao što je neprimećivanje zamene izabranog objekta, konfabulaciju i promenu u preferencijama, kojima bi se trebalo pozabaviti u pokušaju da se efekat objasni. Utvrđeni efekat pokazao se robustnim i repliciran je u brojnim istraživanjima u kojima su razmatrani prigovori na prethodna istraživanja i ponuđena objašnjenja. Da bi objasnili efekat, istraživači su se pozivali na nedovoljnu introspekciju i nepostojanje uvida u sam proces odlučivanja, kao i na potcenjivanje uticaja okolinskih i situacionih faktora. Trenutno nema objašnjenja ili saglasnosti oko mehanizama koji su u osnovi uočenog efekta. Metod istraživanja koji su uveli Johanson i saradnici svakako predstavlja dragoceno oruđe za istraživanje u oblasti psihologije percepcije i kognitivne psihologije, pa čak i u kliničkoj psihologiji i istraživanju stavova, ali postoji još mnogo pitanja o „slepilu izbora“ na koje bi trebalo odgovoriti.

Ključne reči: „slepilo izbora“, „slepilo za promene“, introspekcija

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The Effect of Affective Priming Through Dynamic Stimuli on Recognizing Emotions^{1*}

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Abstract

Emotions are important for everyday communication and it is very useful to recognize them accurately as well as to regulate them. Researching how certain emotional states can be evoked has significant practical implications for everyday life, but also for the work of professionals. Studies of affective priming provide a useful methodological framework for investigating this issue. The aim of this study is to explore affective priming with dynamic stimuli (video material), and the contribution of the age and gender variables to this process. The study involved a total of 307 students from the University of Banja Luka, consisting of 236 female and 71 male participants aged between 19-25 years ($M=22.6$, $SD=1.4$). The research was conducted online with special software created for this purpose. Three factors were varied: congruence of prime and target (congruent, incongruent and absence of prime), gender (male and female) and age (late adolescence and early adulthood). The photos from KDEF (Karolinska Directed Emotional Faces) base were used for the assessment of the emotional facial expressions, and two short video cuts from the Filmsammlung Johannes Hewig's collection called "A revised film set for the induction of basic emotions" were shown as primes. The effect of affective priming was analyzed separately for two emotions - happiness and sadness as targets. The results show a priming effect on recognition of happiness in relation to age. Incongruency between prime and target leads to the inhibition of happiness recognition for younger students. Affective priming was not found in experimental situations where emotion of sadness was targeted.

Keywords: affective priming, facial expression, age, type of emotion, gender

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The Effect of Affective Priming Through Dynamic Stimuli on Recognizing Emotions

Emotions are an important part of our lives and they occur as a response to a situation. Through evolution, they have evolved so that we can respond quickly and efficiently to important life events. Emotions affect our behavior, thinking, memory, and perception, which is why it is very important to recognize and understand them appropriately (Ekman, 2003). The first research on recognizing emotions was related to Ekman's cross-cultural studies that found that expressions of these basic emotions are recognized within different cultures with great accuracy (Ekman & Friesen, 1986). The focus of his interest were primary emotions (happiness, sadness, fear, anger, surprise, and disgust). Longitudinal cross-cultural studies have found that expressions of these basic emotions are recognized within different cultures with great accuracy (Ekman & Friesen, 1986). Such research was aimed at monitoring spontaneous reactions and micro-expressions characteristic of individual emotions. It was determined that the minimum amount of information needed for accurate recognition depended on the type of emotion displayed and on the gender of the model in the displayed photograph. The least information for accurate recognition is needed for the emotion of happiness, whereas the most information is needed for the emotions of sadness and disgust, which are again more easily recognized in male models (Čižmak, 2017). A recent study examined the importance of certain parts of the face in recognizing emotions (Bandyopadhyay et al., 2023). One group of subjects was presented with whole faces that showed a certain emotion, while the other group was presented with only parts of the face - mouth and eyes. The results showed that the accuracy of recognition of universal emotions is very high, but also that there is a difference depending on the way of presentation. Recognition success is higher when only parts of the face are shown compared to the whole face. Such results were obtained for all emotions except disgust.

As already mentioned, emotions affect different aspects of human functioning. They also affect brain activity and can trigger hormonal and autonomic body responses that prepare it for various reactions and complex behaviors (Damasio, 2004; van der Zwaag et al., 2011). Most often, a distinction is made in terms of the arousal-valence of an emotional stimulus, so there are positive/happy and negative/sad emotional stimuli. Considering the above, it can be concluded that it is very important to examine different stimuli and how they induce certain emotional states. Affective priming provides a methodologically valid approach to investigate this. Priming means that context can influence the processing of certain material. In the first phase of the experiment, the subjects are shown a stimulus (a prime), followed by the second stimulus (a target), and the subjects' task is to respond to the second stimulus. The effect of priming is reflected in the facilitation or inhibition of the response to the target stimulus caused by the previously presented prime. Facilitation of the response occurs when the prime and target are congruent, while inhibition occurs when there is an incongruence. Affective priming is one type of priming and

can be more precisely defined as the temporal process in which the target assessment as pleasant or unpleasant decreases when the emotional valence of the prime and target is congruent rather than non-congruent (Abbasi et al., 2019).

There are several theories explaining this phenomenon, among which the best known are the theory of spreading activation (Collins & Loftus, 1975), the theory of affective priming (Fazio et al, 1986; Fazio, 2001), and the theory of separate affective and cognitive systems (Le Doux, 1996; Murphy & Zajonc, 1993; Murphy et al., 1995; Zajonc, 1980). According to the theory of spreading activation, semantic memory is conceptualized as a network of mutually interconnected concepts (Collins & Loftus, 1975). The concepts are represented as nodes that are connected to other nodes of semantic memory by different types of connections. Depending on the specific input, the corresponding node in semantic memory is activated. Activation spreads through the network and it declines after some time. According to the theory of affective priming, the mechanism of action of this phenomenon is based on the time interval between the prime and the target (Fazio et al, 1986; Fazio, 2001). Traces of prime-induced activation enable the facilitation of the response to the next stimulus of the same affective valence if the time interval is optimal. The theory of separate affective and cognitive systems emphasizes that affective and cognitive systems are relatively independent and that the subjects can form an emotional response to a stimulus without its previous recognition due to a short exposure (Le Doux, 1996; Murphy & Zajonc, 1993; Murphy et al., 1995; Zajonc, 1980). This implies that the affective response precedes the cognitive one.

The majority of affective priming studies have used static stimuli, images, or words (Abbasi et al., 2019; Chenggang et al., 2020; Fazio et al., 1986; Fazio, 2001; Kim et al., 2021). In addition to the usual examination of word congruency, a number of studies have used different methodologies with those stimuli. Wu and his colleagues (2020) examined the effect of affective priming depending on the type of word. They used two types – “emotion words” and “emotion-laden words”. Emotion words directly demonstrate affective states, such as sadness, happiness, while emotion-laden words relate to emotion without referring to certain affective states, such as death, promotion. Through two experiments that used a masked and an unmasked paradigm, primes were presented (two types of emotion words), and the subject’s task was to evaluate the valence of the target word. At the same time, their encephalogram was recorded. Behavioral and event-related potential (ERP) results showed that positive words produced a priming effect, whereas negative words inhibited target word processing. The same results were obtained in both experiments. The practical implications of this study are the possibility of improving the effectiveness of emotional communication.

In order to investigate whether affective states influence our decisions even when processed unconsciously, Kim and colleagues (2021) employed a CFS (*Continuous Flash Suppression*) priming task to examine the effect of the two main types of information conveyed by faces on the evaluation of target words as positive or negative. Specifically, they conducted an experiment to determine how two types of facial information (facial identity and emotion) influence subsequent decisions

using a subliminal face with positive and negative target words. A significant interaction effect on response time was observed after priming the angry face, but not the happy or neutral face. This interaction was mainly due to the “positive bias” effect, that is, the advantage of processing positive stimuli, which is in line with earlier research (Kauschke et al., 2019).

Some research indicates that there are gender differences in the successfulness of recognizing facial expressions and that women are superior in comparison to men (Carter & Horgan, 2000; Hall, 1978; Hall, 1984; Mitrović & Trogrlić, 2014). Evolutionary psychologists suggest the “primary caretaker” hypothesis to explain these results. According to this hypothesis, a woman is more capable of recognizing emotions because of her dominant role in the life of her offspring, which increases the probability of their survival (Babchuk et al., 1985). Mothers are very sensitive to the crying of the newborn and to other signals that it sends (need for security, a smile, anxiety, etc.). Hall and Matsumoto (2004) try to explain the mechanism of response to such signals by early socialization. The advantage of women is that they are “taught” from their earliest days to decode emotions better than men, resulting in this ability being more automated than with men (Čižmak, 2017). Gender differences were also found in studies with affective priming and hemispheric lateralization, where it was shown that the affective processing of words is much faster in women (Abbasi et al, 2019).

On the other hand, there are recent studies that do not confirm that women are better at emotion recognition tasks (Hall & Matsumoto, 2004; Hoffman et al., 2008; Hoffman et al., 2010; Kauschke et al., 2019; Leppänen et al., 2003). In research in which participants viewed faces with increasing or decreasing emotional intensity and indicated when they either detected or no longer detected the emotion, both genders were equally successful (Covieres et al., 2021). The only gender differences were found in identifying anger (men were more successful). Men also responded more slowly to fear than women.

Several studies have shown that there are also age differences in the affective priming effect. Younger subjects react faster in conditions when the target is congruent with the prime compared to older subjects. Older subjects are less sensitive to both congruence and incongruity. The priming effect was also found for positive and negative targets in young people, while in the elderly it was present only for positive ones, which implies a favoring of positive emotions in older subjects (Simonetti et al., 2022). Age differences were also found in the recognition of emotions. Relative to their young counterparts, older adults are poorer at recognizing facial expressions, but this is not uniform results. Differences are greatest for the emotions of anger, fear, and sadness, comparative with happiness and surprise, with no age-effect found for disgust (Hayes et al., 2020).

An age period that is particularly significant when it comes to emotional states and reactions is the transition from late adolescence to early adulthood. During this period, changes occur in terms of emotional regulation (Park et al., 2020). Emotional regulation implies processes of modification of emotions and adaptation of the way of their expression. It is very important for success in life and well-being, and it is

assumed that it matures in late adolescence. At that time, young people usually enter university, which is a challenge for them because they have to navigate academically, socially, and interpersonally stressful situations. Therefore, research into the determinants of emotional response and development is particularly important.

In this research, we wanted to examine the effect of affective priming in conditions in which video material is used as a prime. Most previous research has used static stimuli and monitored their effect on the target answers (Abbasi et al., 2019; Chenggang et al., 2020; Fazio et al., 1986; Fazio, 2001; Kim et al., 2021). In these research studies, it was found that the response was facilitated if a face with the same facial expression was shown, as well as that there was an effect of familiarity with the person displayed in the photographs. It was also found that the subjects recognized the emotion of happiness faster than other emotional expressions in the situation when it was preceded by a congruent prime. This research tried to determine how strong an effect can be obtained on a video material, given that it is richer in details and dynamics than a picture or a word. We also wanted to determine whether there were gender differences in the effect of affective priming, as well as whether there were age differences in this process. The practical implication of the research was to understand the connection between emotional state and perception of emotional facial expressions. Recognizing and interpreting emotional expressions is very important because it affects the dynamics of communication with other people. The answer to the question of whether there is affective priming with dynamic stimuli such as video clips could be used in both professional and personal development because it indicates the possibility of consciousness guiding the focus on the desired emotional states.

Method

Sample and Procedure

The sample consisted of students, between 19 and 25 years of age ($M = 22.6$, $SD = 1.4$). The total number of subjects was 307, out of which 236 were female. Participants were divided into two age categories: late adolescence (18-21 years) and early adulthood (22-25 years). In the first category there were 111 students, while in the other there were 196. Since two types of emotions were used as targets, the students were randomly divided into two groups in relation to the displayed target. All subjects gave their voluntary consent for participation in the experiment. There is no Ethics Committee at our Faculty, but we conducted our research in accordance with ethical guidelines stated in American Psychology Association -APA and Declaration of Helsinki.

A mixed factorial design (3x2x2) was used. The first factor is *congruency* (congruent, incongruent, prime absence), second is *gender* (male and female) and third is *age* (late adolescent age 18-21 and early adulthood age 22-25). All three

factors were between-subjects. Congruency was determined by the match between the emotion in the video clip (prime) and the emotion to be recognized (target). An online version of the experiment was created where subjects could answer on a computer or on the mobile phone. A full customized web application was created and set up on the purchased domain live research. The web application collected data that it would store on the „Google Cloud Platform”. Each experiment consisted of three parts:

1. Entering basic data (gender, age).
2. Explanation of the experiment and video content.
3. Experiment

Before the experiment, a general explanation of the research itself was given, after which the subjects could decide whether they wanted to participate or not.

Measures

Photographs from the **KDEF database [Karolinska Directed Emotional Faces]** were used to assess facial expression recognition (Lundqvist et al. 2018). The database contains a total of 4900 photographs of faces that express a neutral facial expression and six basic emotions: happiness, sadness, fear, anger, disgust and surprise. Each facial expression is photographed from several different angles. There are a total of 36 facial expressions that are shown from three angles, front, left and right profile. For the purposes of the research, 30 facial expressions were selected (15 photos of women and 15 photos of men), only the front side, which showed happiness and sadness.

Short video clips from the **Filmsammlung database by Johannes Hewig “A Revised Film Set for the Induction of Basic Emotions”** lasting 01:30 - 02:30 minutes had the prime function. Permission for use was obtained from the author. The two films portrayed two different emotions - sadness and happiness. Video clips were without sound. The sound was turned off for more precise control, as the subject’s focus was on the visual modality. Sounds can enhance an emotional experience, but they can also change it. By turning off the auditory mode, we wanted to avoid such effects.

Results

Before the statistical analysis, the database was checked for outliers with the Interquartile range. It was determined that there are extreme values and they were excluded from further analysis. It was also found that the distribution of the data deviates from the normal (tested with Kolmogorov-Smirnov test) so the reaction times were log-transformed. Three-way ANOVA was then applied. Separate analyses were performed for the two types of emotions (happiness and sadness) that had the function of a target. Descriptive statistical analysis procedures were first applied to the normalized data for happiness. The obtained results are shown in Table 1.

Table 1

Descriptive statistics for reaction time in recognizing happiness emotion

<i>N</i>	<i>M</i>	<i>SD</i>	<i>Min.</i>	<i>Max.</i>
156	4564.09	1911.44	1876.90	10780.98

Descriptive measures in relation to varied factors are shown in Table 2 (for happiness) and Table 4 (for sadness).

Table 2

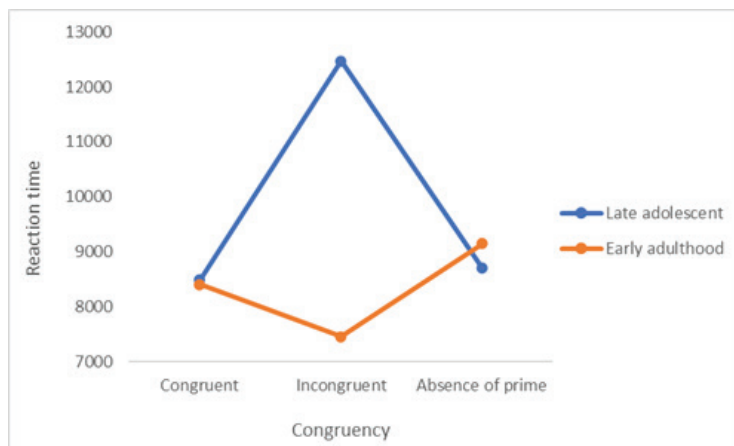
Descriptive statistics for reaction time in relation to varied factors and emotion of happiness as target

Gender	Age	Priming	<i>M</i>	<i>SD</i>	<i>N</i>
Female	LA	Congruent	4784.43	1611.97	13
		Incongruent	5532.34	2250.83	11
		Absence of prime	3978.44	1786.23	11
	EA	Congruent	4571.27	1677.03	22
		Incongruent	4464.13	2246.33	26
		Absence of prime	4748.42	2129.13	37
Male	LA	Congruent	3703.94	707.77	3
		Incongruent	6939.67	1203.87	3
		Absence of prime	4719.43	1173.79	8
	EA	Congruent	3829.69	1086.82	9
		Incongruent	2985.42	982.16	6
		Absence of prime	4398.43	1860.03	7

Note: LA- late adolescence (18-21 years); EA – early adulthood (22-25); N-number of subjects in experimental group

The significance of the obtained differences was tested by applying the analysis of variance. We performed ANOVA by subject. Based on the obtained results, it can be noticed that there are certain differences in the average response speed in different experimental situations.

Analysis shows that the main effect of priming on reaction time is not statistically significant ($F(2, 156) = 1.13, p > .05$). But the main effect of age was determined ($F(1, 156) = 3.87, p < .05, \eta^2 = .026$) and interaction between age and prime was statistically significant ($F(1, 156) = 4.57, p < .05, \eta^2 = .060$). The priming effect was found for younger subjects (late adolescent). Incongruency between prime and target leads to the inhibition of happiness recognition. For the purpose of clarity, the results are also shown graphically (Figure 1).

Figure 1*Affective priming for happiness emotion in relation to age*

The results further show that there is no effect of gender on reaction time in the experimental task ($F(1, 156) = 0.40, p > .05$). Both men and women evaluate and recognize emotion of happiness at approximately the same speed.

On the other hand, when the recognition accuracy was analyzed, the results show that there is no difference in the number of correct answers depending on the prime ($F(2, 156) = 1.67, p > .05$). Additionally, male and female subjects are equal in recognition accuracy ($F(1, 156) = 0.04, p > .05$). Furthermore, the main effect of age is also not statistically significant ($F(1, 156) = 0.425, p > .05$).

When the emotion of sadness was the target, different results were obtained. Table 3 shows descriptive measures for total reaction time, while Table 4 shows statistical descriptive parameters in relation to varied factors. The results of the analysis of variance show that there is no effect of prime on the speed of recognizing the sadness emotion ($F(2, 151) = 0.90, p > .05$). Regardless of content congruency, the video prime did not affect reaction time in recognition tasks. The main effects of age ($F(1, 151) = 0.83, p > .05$) and gender ($F(1, 151) = 0.08, p > .05$) are also not statistically significant.

Table 3*Descriptive statistics for reaction time in recognizing sadness emotion*

N	M	SD	Min.	Max.
151	5073.81	1739.80	1805.03	11300.23

Table 4

Descriptive statistics for reaction time in relation to varied factors and emotion of sadness as target

Gender	Age	Priming	<i>M</i>	<i>SD</i>	<i>N</i>
Female	LA*	Congruent	4624.27	1939.13	17
		Incongruent	4637.97	2069.24	20
		Absence of prime	6033.67	2186.07	13
	EA*	Congruent	5183.49	1681.59	26
		Incongruent	4681.99	1186.27	16
		Absence of prime	5094.44	1731.78	24
Male	LA	Congruent	4737.14	671.78	3
		Incongruent	5006.63	1901.28	12
		Absence of prime	4513.18	1585.35	3
	EA	Congruent	6636.60	1753.77	4
		Incongruent	4771.32	1285.14	12
		Absence of prime	5207.34	1222.33	7

Note. LA- late adolescence (18-21 years); EA – early adulthood (22-25)

In the analysis of the recognition accuracy of the sadness emotion, certain differences were obtained. There is the main effect of gender ($F(1, 156) = 5.63$, $p < .05$, $\eta^2 = .039$) and it explains 3.9% of the variance in total accuracy. Females are more accurate in recognizing sadness compared to men (Figure 2). Results also show that interaction between three factors is statistically significant ($F(2, 156) = 4.47$, $p < .05$, $\eta^2 = .060$). In older male subjects, the presence of a congruent prime led to an increase in accuracy in recognizing an emotion (Figure 3).

Figure 2

Number of correct answers in recognizing sadness in relation to gender

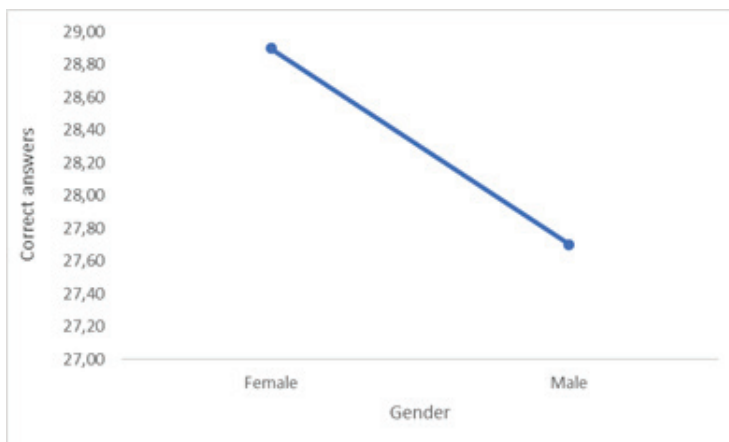
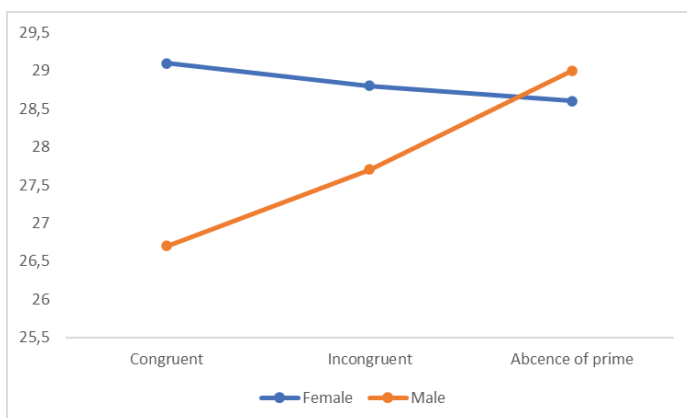
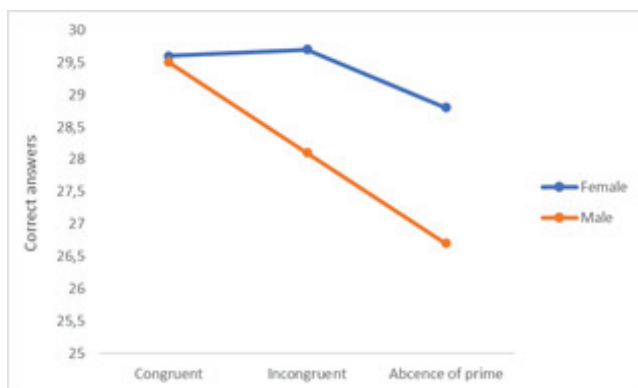


Figure 3

Number of correct answers in recognizing sadness in relation to gender, age and priming (left-late adolescents, right-early adulthood)*

**Discussion**

The aim of this research was to explore affective priming with dynamic stimuli - video clips from movies, since most previous studies used static stimuli (Bandyopadhyay et al., 2023; Calvo & Lundqvist, 2008; Ekman & Friesen, 1975; Hoffmann et al., 2010; Montagne et al., 2005). Although a number of previous studies have shown that priming can lead to facilitation or inhibition of target responses, this study with dynamic prime partially confirms this (Chenggang et al., 2020; Fazio, 2001; Fazio et al, 1986; Murphy & Zajonc, 1993). Inhibition of responses was obtained in younger subjects, when the prime was incongruent with the target. Such a result was present only in the experimental situation in which the subjects responded to the emotion of happiness. A similar finding was also obtained

by Jing and colleagues (2007), which indicates a greater sensitivity of young people to affective priming. In their research, they had subjects with larger age differences, but the focus of our research was the transitional period between adolescence and early adulthood, when more people enroll in college and start a new phase of life. Our results indicate that younger subjects are more sensitive to the incongruity between the prime and the target, but response facilitation was not found, which is not in line with earlier research (Fazio et al., 1986; Jing et al., 2007; Murphy & Zajonc, 1993). In contrast to those research studies, videos were used as primes in this study. Although videos are more dynamic, it is also possible that they are more complex, and thus the mechanism of their influence is more complex. One of the possible explanations is that the video without sound is not strong enough to induce an emotional state, considering that Loizou and Karageorghis (2014) in their research found an interactive effect of video and music in priming. Zhu and Takeda (2023) found a significant effect of stimulus relevance on affective priming. The presentation of video material enables the redistribution of attention to different aspects of the content, and the way of processing that content can be changed. On the other hand, the results can perhaps be best explained by the Affective Persuasion Theory most advocated by Fazio (Fazio et al., 1986; Fazio, 2001). According to this theory, varying the time interval proved to be a very significant factor for the affective priming effect. The strongest effect is obtained when the interval is 300ms, and it is absent when the time interval is 1000ms. The length of the presentation of the video was longer than two minutes, which is much longer and is probably the reason for the lack of influence on the emotional states of the participants. Moreover, results show that recognizing accuracy of happiness emotion are the same independently of varied factors. It has already been shown that this type of emotion is the easiest to recognize because it requires the least amount of information, which can also explain these results.

In the experimental situation in which the facial expression of sadness was the target, no priming effect was obtained. It is not clear whether the effect was absent because of the nature of the emotion being recognized or because of the prime. The importance of the time frame, which could have influenced the results, has already been mentioned. An explanation for those results can be found in the works of the authors who emphasized individual sensitivity. There, the separation of perceptual processing from affective processing is highlighted, but the need to adapt the stimulus to individual participants is also emphasized (Delicato, 2020). We did not measure or control individual sensitivity to the selected primes.

When it comes to gender differences, previous research studies show the dominance of female gender in terms of accuracy and speed of recognition of facial expressions (Calvo & Lundqvist, 2008; Leppänen et al., 2003; Milovanović et al. 2013), which was partially confirmed in this research, since we found gender differences only in recognition accuracy, and for sadness emotion. The results also showed that there was an interactive effect of priming, gender and age on the recognition of the emotion of sadness. The congruence of the prime and the target affected the accuracy of recognition among male subjects of the older age category.

Some of the limitations of this study are related to age categories. The differences between them are small. The differences could be more noticeable if subjects with larger age differences were compared. We have already mentioned the time frame of the prime that was used, as well as the lack of pilot testing of its subjective experience. Also, we used only two primary emotions. According to the FACS coding model (Ekman & Friesen, 1975), the expression of emotions activates different groups of muscles in the area of the eyes and mouth, and the differences between primary emotions are easily noticeable. Considering the differences obtained in this research, in future studies the effect of persuasion through video material should be investigated in the context of the facial feedback hypothesis. The concept of individual sensitivity to different video primes should also be considered.

It would also be interesting to use the same procedure to examine the recognition of other basic emotions that are classified as unpleasant, such as anger or fear. In some of the future research, it could be examined whether there is a certain pattern of responding to facial expressions. Such research has significant practical implications because it can help in understanding emotional reactions, and can also shape our emotions, behaviors and social interactions.

Conclusion

This research provides significant insights into the mechanisms of affective priming and demonstrates the importance of context in emotional responding. However, it is a very complex process that requires further research and the inclusion of a large number of factors.

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Efekat afektivnog primovanja pomoću dinamičnih stimulusa na prepoznavanje emocija

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Apstrakt

Emocije su važne za svakodnevnu komunikaciju i veoma je korisno da ih tačno prepoznamo kao i da ih regulišemo. Istraživanje načina na koji se mogu izazvati određena emocionalna stanja ima značajne praktične implikacije za svakodnevni život, ali i za rad profesionalaca. Studije afektivnog primovanja pružaju koristan metodološki okvir za istraživanje ovog pitanja. Cilj ove studije je da se istraži afektivno primovanje sa dinamičkim stimulusima (video materijal) i doprinos varijabli uzrasta i pola ovom

procesu. U istraživanju je učestvovalo ukupno 307 studenata sa Univerziteta u Banjoj Luci, od toga 236 ženskih i 71 muških ispitanika uzrasta između 19- 25 godina. Istraživanje je sprovedeno onlajn uz pomoć specijalnog softvera kreiranog za ovu svrhu. Tri faktora su varirala: podudarnost prima i mete (kongruentno, nekongruentno i odsustvo prima), pol (muški i ženski) i uzrast (kasna adolescencija i rano odraslo doba). Za procjenu emotivnog izraza lica korišćene su fotografije iz baze KDEF (Karolinska Directed Emotional Faces) i dva kratka video isječka iz kolekcije Filmsammlung Johannes Hevig pod nazivom „Revidirani filmski set za indukciju osnovnih emocija”. Efekat afektivnog primovanja analiziran je odvojeno za dvije emocije- sreću i tugu kao mete. Rezultati pokazuju primarni efekat na prepoznavanje sreće u odnosu na starost. Nepodudarnost između prima i mete dovodi do inhibicije prepoznavanja sreće kod mlađih ispitanika. Afektivno primovanje nije pronađeno u eksperimentalnoj situaciji u kojoj je meta bila emocija tuge.

Ključne riječi: afektivno primovanje, izraz lica, uzrast, vrsta emocije, pol

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The Examination of Aesthetic Evaluations of Female Portraits in Pablo Picasso's Oeuvre¹

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Abstract

The issue of this study was to examine whether aesthetic evaluations of female portraits from various painting periods in Pablo Picasso's oeuvre differ in terms of arousal potential (AP) and primordial content (PC). Additionally, this study examines the trends of aesthetic evaluations in a time perspective, i.e., whether they correspond to the assumptions of Colin Martindale's evolutionary theory. The research was conducted on a convenient sample of 55 young adults ($M = 23.9$ years, $SD = 2.46$). The stimulus material consisted of 16 (4x4) female portraits belonging to Picasso's blue period, rose period, analytic cubism, and synthetic cubism. The scales of arousal potential (AP) and primordial content (PC) were used to measure aesthetic evaluations. One-way ANOVA results indicated statistically significant differences in the expression of AP ($F(3, 876) = 44.16, p = .000, \eta^2 = .142$) and PC ($F(3, 876) = 176.61, p = .000, \eta^2 = .388$) depending on Picasso's artistic periods. Post hoc Tukey test showed statistically significant differences in the values of these dimensions within individual periods. This means that the aesthetic evaluations of the respondents clearly separate these four periods. Also, the trends of aesthetic evaluations of female portraits from different periods of Pablo Picasso's oeuvre were examined as a function of time, i.e., the order in which the portraits were created. A statistically significant expected trend of moderate linear growth was obtained in AP assessments ($R^2 = .57, F(3, 876) = 44.2, p < .001$). In the estimation of PC ($R^2 = .897, F(3, 876) = 177, p < .001$) the trend is also significant, but the interpretation of the results should be cautious due to the small number of stimuli within each period. It is necessary to conduct more detailed research, on a larger sample of respondents, but also with a larger sample of stimuli. It was also useful to conduct a qualitative analysis in order to delve deeper into the problem of aesthetic experience and compare the results with the claims of theorists and art historians.

Keywords: arousal potential, primordial content, female portraits, Pablo Picasso

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The Examination of Aesthetic Evaluations of Female Portraits in Pablo Picasso's Oeuvre

The first understandings of aesthetic experience and aesthetic judgments date back to ancient Greece, and later they were explored by philosophers, psychologists, aestheticians, and others. They all sought the structure of aesthetic experience, which led to the development of many theories (Milićević, 2019). One of the most well-known is Martindale's theory of aesthetic evolution (1990), which has been tested in many studies and has always shown partial success in explaining the phenomenon of aesthetic experience. The aim of this research was to examine whether the aesthetic judgments of female portraits from different artistic periods in the works of Pablo Picasso differ in terms of arousal potential and primordial content. Additionally, this study examined the trends in aesthetic judgments over time and whether they correspond to the assumptions of Colin Martindale's theory of aesthetic evolution.

Colin Martindale's Theory of Aesthetic Evolution

Colin Martindale is the creator of the theory of aesthetic evolution, which has changed the existing knowledge in the history of art. In his seminal work "Clockwork Muse: The Predictability of Artistic Change", Martindale (1990) approaches the history of art in an original and empirical way. Unlike classical art historians who considered trends in artistic styles to be random (e.g. Elliot, 1988, as cited in Martindale, 1990, p.2), he believes they are regular, repeatable, and describes them using regression equations. To confirm his standpoint, he examined microstyles, i.e., the individual careers of specific artists, using semantic differential scales on samples composed of "naive" subjects, i.e., subjects without artistic education (Martindale, 1990; Milićević, 2019, 2024).

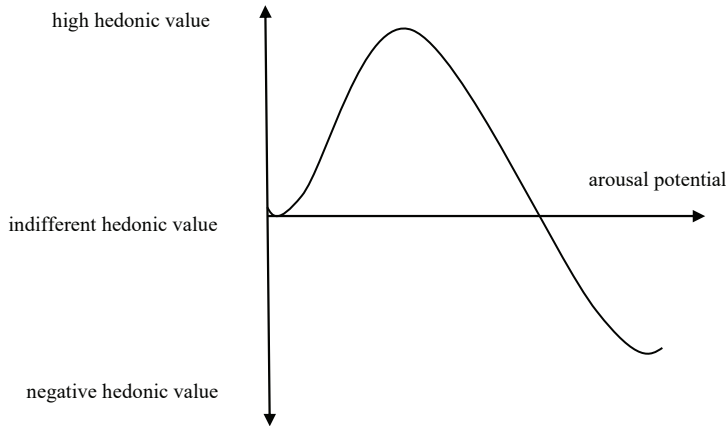
In his theory, Martindale (1990) starts from Berlyne's concept of *arousal potential* and the Wundt curve. Berlyne (1971) believed that the preference for a stimulus depends on its arousal potential. Arousal potential is defined as the amount of activation a stimulus induces and consists of the following factors: collative properties (novelty, complexity, surprise, and unpredictability), ecological factors (signal value and meaning), and psychophysical characteristics of the stimulus (pitch, color, and intensity). People tend to prefer stimuli with a moderate level of arousal potential to those with extremely high or low arousal potential. The relationship between arousal potential and hedonic value is represented by the Wundt curve, which has the shape of an inverted U (Figure 1).

Artists do not strive to create works that are identical to already existing ones, so diversity, incongruence, novelty, unpredictability, and other collative variables are the main characteristics of art. An artwork must constantly evolve in order to survive and not succumb to habituation (Martindale, 1990). Habituation is a concept from behavioral learning theory and can be defined as a decrease in an organism's reactivity

when exposed to repeated stimuli. Therefore, the artist is forced to continually increase the arousal potential of his works of art according to the principle of least effort in order to neutralize habituation (Martindale, 1990, Milićević, 2019, 2024).

Figure 1

The Relationship between arousal potential and hedonic value (Berlyne, 1971, Martindale, 1990; Ognjenović, 1997)



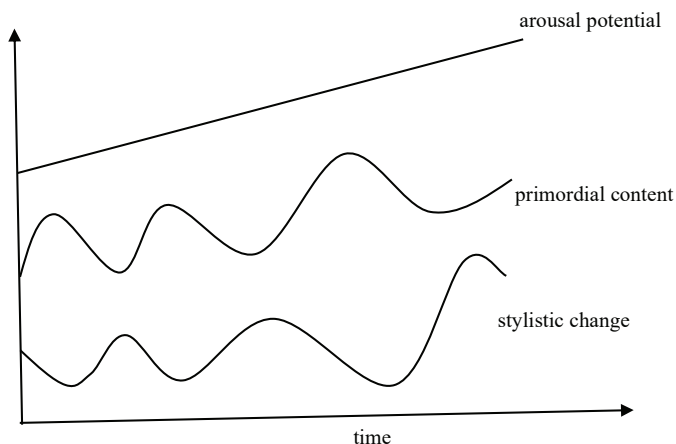
In addition to arousal potential, Martindale (1990) mentions another factor in his theory of aesthetic evolution, which is *primordial content*. This primarily refers to originality and determines the direction of aesthetic evolution. Many theorists have previously discussed it, but under different names. Ernst Kris (1952) believed that original ideas consist of two processes of inspiration - one involving regression and the other involving a state of elaboration. Freud et al. (1954) spoke of secondary and primary processes of cognition. The secondary process of cognition is logical, reality-oriented, while the primary process of cognition is irrational, freely associative, akin to dream thought, daydreaming, and sometimes close to madness. Berlyne (1965, as cited in Milićević, 2019) distinguishes between autistic and directed thinking. Jung uses the terms *logos* and *eros*, while Nietzsche distinguishes between Apollonian and Dionysian thought (Martindale, 1990).

Martindale (1990) differentiated between primordial (initial) thought versus conceptual thought, believing that all our thoughts exist on a continuum from primordial thought on one side to conceptual thought on the other. When we discover differences, our thought is more conceptual, and when we find similarities, our thought tends toward primordality. Primordial thought is non-directive and freely associative, increasing the likelihood of combining new elements and thereby enhancing the originality of the artwork. Artists tend to increase primordial content, i.e., originality, which in turn increases arousal potential and prevents habituation. The increase in primordial content cannot go on indefinitely; it reaches a maximum, after which there is a “loosening” of stylistic rules, leading to changes in artistic style (Martindale, 1990). Arousal potential gradually increases throughout the history

of art, while primordial content also increases but only to a certain limit. Stylistic changes and primordial content are in opposite phases, meaning that when one rises, the other falls, and vice versa (Figure 2).

Figure 2

The Relationship between arousal potential, primordial content, and stylistic changes over time (Martindale, 1990)



Martindale (1990) tested his theory on numerous examples of the history of painting from different areas of Europe and America, Gothic architecture, Egyptian paintings, Greek vases, world literature, European music of different eras, and even New England gravestones. He also examined individual artistic careers of various famous artists such as Beethoven, Chopin, Grieg, Rembrandt, Picasso, Dryden, Wordsworth, Yeats, and many others. He managed to find regularity in the dynamics of arousal potential and primordial content everywhere, with peaks of primordial content coinciding with the beginnings of new styles. Thus, Martindale (1990) succeeded in discovering regularities in stylistic changes throughout the history of art in an original and empirical way.

The Art of Pablo Picasso

Pablo Picasso was a versatile Spanish artist, one of the greatest painters, graphic artists, and sculptors of the 20th century (McCully, 2021; Trifunović, 1994). His interest in art manifested very early; the first word he spoke was “piz” from the Spanish “lapis,” meaning pencil, and by the age of thirteen, he was creating works comparable to those of Renaissance painters. He did not care for formal education, so he did not complete art academy, but this did not prevent him from becoming an excellent artist. Besides being a great artist, he is, along with Georges Braque, considered one of the founders of the art movement known as Cubism. His creative opus is extremely large, numbering around 80,000 works, making him the artist

with the largest creative output in the history of art according to the Guinness World Records. His creative work can be chronologically divided into several periods, each marked by specific influences, dominant themes, and an increasing approach to Cubism. Some of the well-known periods in his work are: the Blue Period (1901-1904), the Rose Period (1904-1906), Analytical Cubism (1909-1912), and Synthetic Cubism (1912-1914), to which he remained faithful throughout his career, perfecting it with ongoing changes in art development (Požgaj, 2020; Trifunović, 1994).

Picasso's Blue Period (1901-1904) is characterized by monochromatic paintings in shades of blue and blue-green, with occasional inclusion of other colors. Dominant themes in this period include the blind, beggars, and lonely outcasts he painted on the streets of Barcelona, as well as the theme of motherhood, inspired by visits to a women's prison in Paris and observing prisoners with their children (McCully, 2021). His paintings from this period reflect feelings of sadness, melancholy, and desolation, mirroring his mood following the suicide of his close friend Carlos Casagemas. During the Rose Period (1904-1906), Picasso met his lover Fernande Olivier, which infused his work with more enthusiasm and vigor. His works from this period are characterized by the dominance of pink and orange colors, featuring Fernande, whom Picasso called his muse, along with many circus figures, acrobats, and harlequins, typical of the French milieu. His paintings become much more positive, reflecting a joyous and optimistic mood.

Analytical Cubism (1909-1912) is an art style that Picasso developed together with Georges Braque, resulting in similar works between the two. During this period, Picasso used monochromatic and neutral colors, mainly brown, analyzing and fragmenting objects into parts, giving the impression of broken spaces and objects (Požgaj, 2020). His paintings from this period are impersonal, monochromatic, ascetic, and devoid of psychological depth. Synthetic Cubism (1912-1914) represents the further development of Cubism. In Synthetic Cubism, objects are no longer dissected but instead, one characteristic part of an object is combined with a part of another object to form a new whole (Milićević, 2005). This synthesis inevitably led to abstraction, but to avoid this and maintain contact with reality, Cubists used new means such as typography and collage. Picasso was the first to glue paper fragments, wallpapers, and pieces of newspaper articles onto his paintings, introducing collage into fine art. During this period, geometric composition became very visible in his paintings, with themes often including musicians, still lives, and portraits. Picasso remained faithful to Cubism throughout his career, continuously perfecting it, enriching it with new themes, and integrating it with emerging art movements such as Surrealism. The influence of Surrealism on his work can be seen in the dissection of the human body, disproportionate representation of content, and the introduction of erotic elements in his works (Požgaj, 2020; Trifunović, 1994).

Review of Previous Research

Martindale was one of the first to attempt and succeed in answering the question: “Can regularities in stylistic changes be empirically tracked and discovered?” His work on this problem was dedicated and thorough, so starting from a simple question, he developed his theory, which is still used today as a foundation for many studies. Martindale applied the theory of aesthetic evolution while studying the individual artistic careers of Beethoven, Chopin, Grieg, Rembrandt, Picasso, Dryden, Wordsworth, Yeats, and others, and he managed to find regularities in the dynamics of arousal potential and primordial content, with peaks of primordial content coinciding with the beginnings of new styles. In Picasso’s work, based on the change in arousal potential, i.e., its linear increase, he successfully distinguishes the blue, pink, and other periods or microstyles (Martindale, 1990).

In our region, Milićević et al. (2016) conducted a study examining changes in Van Gogh’s landscape painting technique during five periods of his work. The results of this study did not confirm all the hypotheses according to the theory of aesthetic evolution, but were consistent with the characteristics of individual periods and the assertions of art critics and historians.

Arnheim (1962), Weisberg (2004), and Milićević (2001, 2005) attempted to find regularities in the process of the genesis of Picasso’s *Guernica* sketches. Arnheim based his research on qualitative analysis, while Weisberg and Milićević used quantitative methods. Weisberg (2004) concluded that the creative process largely appears as an elaboration of a basic idea rather than the creation of numerous different ideas. Milićević (2005) tracked changes in arousal potential and primordial content during the creation of the work and found regularities consistent with Martindale’s theory. Aaron Kozbelt (2006) used a similar approach, analyzing 22 sketches of Matisse’s *Large Reclining Nude* from 1935, concluding that art students and non-art students apply different patterns of aesthetic judgment. Art students appreciate Matisse’s personal opinion more and they are better at recognizing fluctuations in quality during the development of the painting (Kozbelt, 2006). Despite numerous transformations that occur during the creation of an artwork, the consistency of the painting as a whole is noticeable throughout its development. Creators are believed to have good control over the complex creative process, with metacognition being a very important component of effective problem-solving, even in complex, ill-defined problems (Jaarsveld & Van Leeuwen, 2005).

Besides exploring the regularities in the process of the genesis of the artwork as a whole, there are also attempts to explain the genesis of specific details within an artwork. Milićević (2001) conducted research on the genesis of the bull’s head detail in Picasso’s *Guernica* and obtained results consistent with Martindale’s theory of aesthetic evolution. Subsequent studies investigated the genesis of the horse’s head detail and obtained identical results (Milićević, 2005; Milićević et al, 2010). However, studies examining the genesis of the woman’s head detail obtained results only slightly consistent with Martindale’s theory, where the arousal potential increased to the point that some sketches became unappealing (Milićević, 2005;

Milićević et al., 2012). The reasons cited the fact that the sketches of the woman's heads resulted in four figures in the final Guernica.

Starting from Martindale's evolutionary theory (1990), we set the following goals in our research:

1) To examine whether the aesthetic evaluations of female portraits of four different periods in the oeuvre of Pablo Picasso differ in terms of the dimensions of arousal potential (AP) and primordial content (PC).

2) To examine the trends of these aesthetic evaluations of 16 portraits in a time perspective and whether they correspond to the assumptions of Colin Martindale's theory of aesthetic evolution (1990).

Hypotheses

H1. In accordance with Martindale's theory, we assumed that the aesthetic evaluations of AP and PC female portraits from the four periods of Picasso's oeuvre (blue period, pink period, analytical and synthetic cubism) will statistically significantly differ from each other. We assume that based on the AP and PC assessments, we would clearly distinguish these four microstyles in Picasso's individual career.

H2 Based on the evolutionary theory (Martindale, 1990) regarding AP and PC trends in time perspective, we can assume the following:

a) The arousal potential (AP) of Picasso's 16 female portraits will grow monotonously and moderately over time.

b) The measures of primordial content (PC) Picasso's 16 female portraits will also increase as a function of time, but not linearly. PC "should exhibit cycles of increasing and decreasing. Periods when PC decreases should coincide with periods of stylistic change." (Martindale, 1990. p.69).

c) We can also assume that the estimates of AP and PC portraits of the blue and pink periods should be lower than the estimates of AP and PC portraits of the analytical and synthetic cubism periods.

Method

Sample and Procedure

The research was conducted online. Ethical principles were followed in the research, which included: voluntary participation, informed consent, anonymity, confidentiality, the ability to communicate about the results, the ability for respondents to stop participating in the research at any time. All important information for participating in the study and completing the questionnaire was given to participants. Participants were asked to evaluate images presented to them without time constraints, based on certain attributes. The sample is a convenience consisting of 55 young adults, ranging from 18 to 29 years old. Initially, there were 57 participants, but two were excluded from further analysis due to inadequate questionnaire completion. The

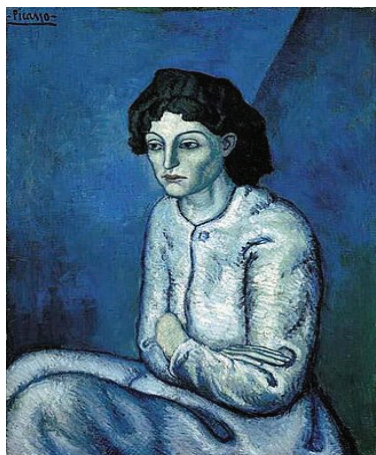
sample predominantly consisted of females, with 41 female (74.5%) participants, and 14 (25.5%) males. The average age of participants was 23.9 years ($SD = 2.46$), with an age range from 20 to 29 years. Only 4 respondents (7.3%) had some artistic education (Art school or faculty of Art), while 51 (92.7%) did not.

Stimuli

The stimulus material consists of 16 (4x4) female portraits from different periods of Pablo Picasso's work (Image 1).

Image 1

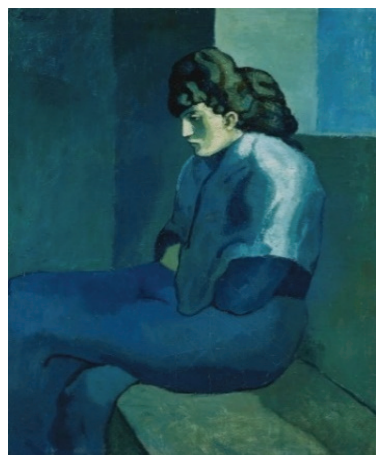
Portraits of Women - Blue Period



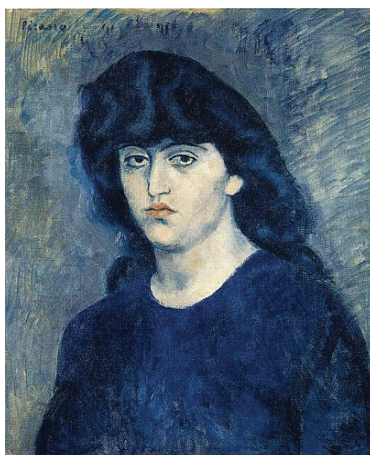
1901 – Woman with Folded Arms
(Private collection)



1902 – Woman with Bangs
(The Baltimore Museum of Arts, Maryland)



1903 – Melancholy woman
(The Detroit Museum of Art, Michigan)



1904 – Portrait of Suzanne Bloch
(Sao Paulo Museum of Art)

The images are divided into four categories according to the period they belong to: the blue period, the pink period, analytical cubism, and synthetic cubism. Each category contains 4 images, presented in chronological order:

Blue period:

1. Pablo Picasso, 1901, *Woman with Folded Arms* (Private collection)
2. Pablo Picasso, 1902, *Woman with Bangs* (The Baltimore Museum of Art, Maryland)
3. Pablo Picasso, 1902-1903, *Melancholy woman* (The Detroit Museum of Art)
4. Pablo Picasso, 1904, *Portrait of Suzanne Bloch* (Sao Paulo Museum of Art)

Rose period:

5. Pablo Picasso, 1904, *Woman with a red shawl (Suzanne Bloch)* (Private collection)
6. Pablo Picasso, 1905, *Mother and Child* (Private collection)
7. Pablo Picasso, 1905-1906, *Portrait of Gertrude Stein* (Metropolitan Museum of Art, New York)
8. Pablo Picasso, 1906, *Nude with Joined Hands* (Art Gallery of Ontario)

Analytical Cubism:

9. Pablo Picasso, 1909, *Head of a Woman* (The Art Institute of Chicago)
10. Pablo Picasso, 1910, *Girl with a Mandolin* (Museum of Modern Art, New York)
11. Pablo Picasso, 1911, *Afternoon tea* (Philadelphia Museum of Art)
12. Pablo Picasso, 1912, *Woman sitting in an armchair* (Private collection)

Synthetic Cubism:

13. Pablo Picasso, 1912/1913, *Woman in an Armchair* (Collection Mrs. Victor W. Gantz, New York)
14. Pablo Picasso, 1913, *Woman with a shirt sitting in a chair* (Metropolitan Museum of Art, New York)
15. Pablo Picasso, 1913-1914, *Head of The Girl with a Hat Topped with*

Raisins (Private collection)

16. Pablo Picasso, 1914, *Portrait of a Girl* (Musee National d'Art Moderne, Centre Georges Pompidou, Paris)

The pictures were presented in chronological order (according to the date of creation). Martindale (1990) used a chronological order in the presentation of stimuli and not a random one, because such an order best simulates what really happened during stylistic changes during history and an individual artistic career.

Instruments

Arousal Potential (AP; Martindale, 1990) and **Primordial Content (PC; Martindale, 1990)** were developed within the framework of Martindale's theory of aesthetic evolution. These scales are of the semantic differential type, consisting of

pairs of opposing adjectives or attributes. Respondents indicate their agreement with one of the adjectives by selecting a value ranging from 1 to 7. The Arousal Potential (AP) scale includes the following pairs of opposing adjectives: simple-complex, passive-active, and weak-strong. The Primordial Content (PC) scale includes pairs such as real-unreal, earthly-otherworldly, and natural-unnatural. In the current sample, internal consistency reliability has been found to be satisfactory with the following values: Arousal Potential ($\alpha = .775$; $\Omega = .778$), and Primordial Content ($\alpha = .947$; $\Omega = .947$).

Results

Table 1

Descriptive statistical data of dimensions of aesthetic experience

	<i>M</i>	<i>Med</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>	<i>Sk</i>	<i>Ku</i>
Arousal potential	4.04	4.00	1.45	1	7	-.027	-.647
Primordial content	3.67	3.67	1.98	1	7	.183	-1.227

Note. Sk – skewness, asymmetry coefficient; Ku – kurtosis, elongation coefficient.

Table 1 shows that the range of respondents' answers on the mentioned scales is from 1 to 7. The distribution of measures on the arousal potential variable does not deviate from normal (the range of skewness and kurtosis values is +/-1). However, the distribution of measures on the primordial content variable gives a platykurtic distribution, given that the kurtosis value is less than -1. This indicates increased dispersion, i.e., the scattering of the distribution of results.

To examine whether there are differences in the expression of the dimensions of the aesthetic experience of female portraits in different periods of Pablo Picasso's work: blue period, rose period, analytical cubism, and synthetic cubism, a one-way ANOVA was used.

Table 2

	<i>F</i>	<i>df1</i>	<i>df2</i>	<i>p</i>	η^2
Arousal potential (AP)	44.16	3	876	.000	.142
Primordial content (PC)	176.61	3	876	.000	.388

Differences in the expression of dimensions of aesthetic experience of female portraits during the creative periods of Pablo Picasso (One-Way ANOVA)

Note. η^2 - eta squared (measure of effect size).

Based on the results (Table 2), it can be concluded that there is a statistically significant difference in the expression of arousal potential in female portraits during the blue period, rose period, analytical cubism, and synthetic cubism. There is also a statistically significant difference in the expression of primordial content in female portraits during the four periods.

Since ANOVA only indicates the presence of differences but does not specify between which periods the differences in the dimensions of the aesthetic experience exist, a post hoc Tukey test was used to detail these differences.

Table 3 shows that there is a statistically significant difference in the expression of arousal potential in favor of the rose period compared to the blue period, in favor of analytical cubism compared to the blue period, and in favor of synthetic cubism compared to the blue period. There is also a statistically significant difference in the expression of arousal potential in favor of analytical cubism compared to the rose period and in favor of synthetic cubism compared to the rose period.

Table 3

Results of the Tukey test for arousal potential values (AP) of female portraits in different creative periods of Pablo Picasso

	M	SD	SE		Blue period	Rose period	Analytical cubism	Synthetic cubism
Blue period	3.29	1.27	.086	(mean difference)	—	-.51***	-1.24***	-1.33***
Rose period	3.80	1.35	.091	(mean difference)		—	-.74***	-.74***
Analytical cubism	4.53	1.41	.095	(mean difference)			—	.009
Synthetic cubism	4.53	1.36	.092	(mean difference)				—

Note. *** $p < .001$; SE – standard error.

Figure 3

Arousal potential of female portraits in different creative periods of Pablo Picasso

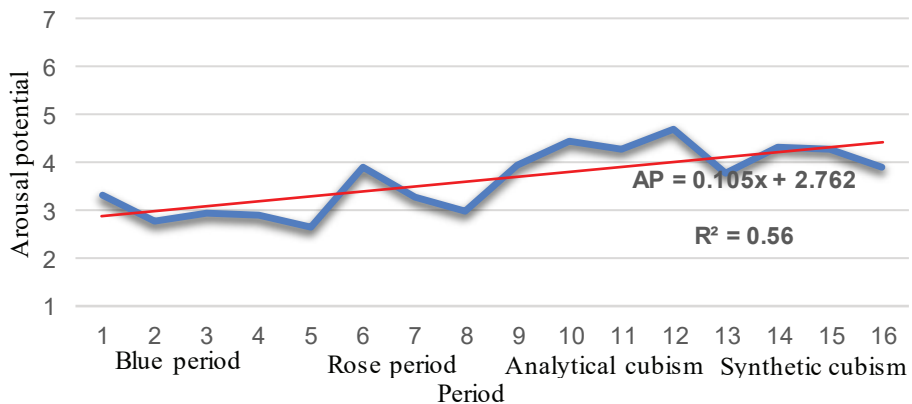


Figure 3 shows that a statistically significant trend was obtained in the aesthetic evaluations of arousal potential, indicating that the evaluations of arousal potential increase linearly over time from the blue period to analytical cubism. However, an unexpected drop in arousal potential is observed during the period of synthetic cubism. The sequence, i.e., the date of creation of the paintings, proved to be a good predictor of the arousal potential evaluations of 16 female portraits from Picasso's blue period, rose period, and analytical cubism: $R^2 = .566$, $F(3, 876) = 44.2$, $p < .001$. The corresponding linear equation can explain 56.6% of the variance.

Table 4 shows that there is a statistically significant difference in the expression of primordial content in favor of analytical cubism compared to the blue period and in favor of synthetic cubism compared to the blue period. There is also a statistically significant difference in the expression of primordial content in favor of analytical cubism compared to the rose period and in favor of synthetic cubism compared to the rose period. Additionally, there is a statistically significant difference in the expression of primordial content in favor of synthetic cubism compared to analytical cubism.

Table 4

Results of the Tukey test for primordial content values (PC) of female portraits in different creative periods of Pablo Picasso.

	<i>M</i>	<i>SD</i>	<i>SE</i>		Blue period	Rose period	Analytical cubism	Synthetic cubism
Blue period	2.38	1.34	.090	(mean difference)	—	-.36	-1.76***	-3.06***
Rose period	2.74	1.54	.104	(mean difference)		—	-1.40***	-2.70***
Analytical cubism	4.13	1.90	.128	(mean difference)			—	-1.31***
Synthetic cubism	5.44	1.41	.095	(mean difference)				—

Note. *** $p < .001$; SE – standard error.

Figure 4

Primordial content (PC) of female portraits in different creative periods of Pablo Picasso

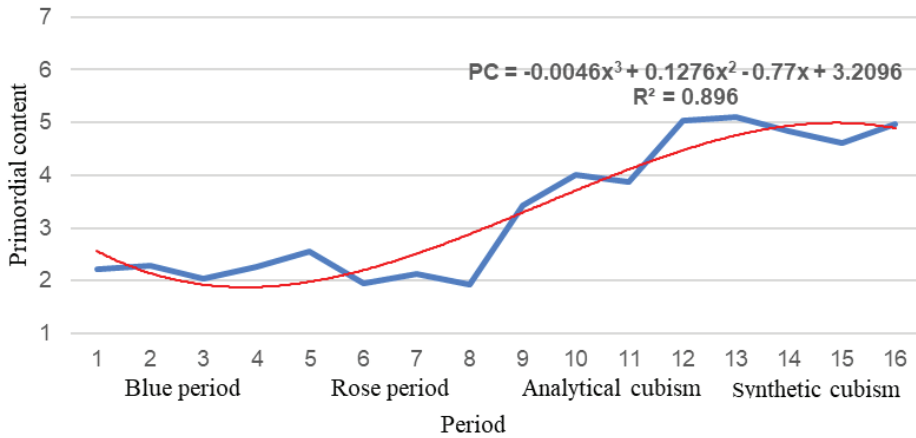


Figure 4 shows that a statistically significant trend was obtained in the aesthetic evaluations of primordial content, indicating that evaluations of primordial content increase linearly over time but also vary within individual periods. There is no recorded difference in primordial content between the blue period and the rose period. The order, i.e., the date of creation of the paintings, proved to be a good predictor of the primordial content evaluations of 16 female portraits from Picasso's blue period, rose period, analytical and synthetic cubism: $R^2 = .897$, $F(3, 876) = 177$, $p < .001$. The corresponding cubistic equation can explain 89.7% of the variance.

Discussion

This study examined the existence of differences in the expression of aesthetic experience dimensions depending on the period of Pablo Picasso's creative work. Additionally, it investigated the trends of aesthetic evaluations over time and whether they align with the assumptions of Colin Martindale's theory of aesthetic evolution.

(1) The main assumption that the aesthetic evaluations of AP and PC of female portraits from the four periods of Picasso's oeuvre (blue period, rose period, analytical and synthetic cubism) will differ statistically significantly was partially confirmed.

The styles differ from each other in relation to AP estimates except when dealing with synthetic and analytical cubism (Table 3). Portraits from analytical and synthetic cubism evoke an equal arousal potential that is higher than the female portraits of the blue and rose periods. The arousal of female portraits grows successively during four periods. The lowest AP is in the blue period, higher in the rose period, and the highest in the period of analytical and synthetic cubism. These findings are consistent with previous findings (Martindale, 1990; Milićević & Jovanović, 2013, 2015) and with

the assumptions of evolutionary theory. The results also correspond to the claims of theorists and art historians (Trifunović, 1994).

When it comes to the primordial content (PC), the hypothesis that female portraits from the four periods will differ was fully confirmed. Blue period portraits have the lowest PC ratings, rose period portraits have slightly higher PC ratings, followed by analytical cubism portraits, and synthetic cubism portraits have the highest PC ratings. This is consistent with the assumptions and results of Colin Martindale's (1990) evolutionary theory. Based on the evaluation of the primordial content, the mentioned four periods in the oeuvre of Pablo Picasso can be clearly distinguished.

(2) We examined the trends of aesthetic evaluations of arousal potential (AP) and primordial content (PC) of 16 portraits in a time perspective. The results correspond to the assumptions of Colin Martindale's theory of aesthetic evolution (1990). Sixteen female portraits were presented to respondents in chronological order by date of creation.

According to evolutionary theory, it was assumed that estimates of arousal potencies (AP) will gradually increase as a function of order (i.e., date) of creation. Regression analysis showed that the order of creation of 16 female portraits by Picasso is a good predictor of arousal potential (AP) assessment. The corresponding linear equation can explain 56.6% of the variance AP in function of the order of creation (Figure 3).

Despite the oscillations of AP in certain portraits, especially in the blue period, the trend is significant and corresponds to the assumptions of Martindale's evolutionary theory. Over time, the artist gradually increases the arousal potential of his works in order to counteract the habituation of the audience. The stagnation and decline of AP in the blue period are consistent with the theme and content of the paintings. The blue period is characterized by monochromatic images with shades of blue and blue-green. The dominant themes in the paintings are quite depressing. Portraits of this period express feelings of sadness and melancholy. All this does not cause high excitement among the audience.

In the rose period, themes and colors are brighter, so there is an increase in AP and later a certain decrease. In analytical cubism AP increases and in synthetic cubism it slowly decreases. Nevertheless, despite these oscillations, the AP growth trend is significant and corresponds to Martindale's (1990) and our assumptions.

The assumption that the primordial content (PC) of Picasso's 16 female portraits will grow as a function of the time (order) of creation has been confirmed. The corresponding cubist equation explains 89% of the variance of PC as a function of time.

Evolutionary theory, based on its numerous studies of long periods of art history (Martindale, 1990), predicts that this growth will take place with oscillations. The peaks of PC growth and the beginnings of its decline correspond to the establishment of a new style. The trends of stylistic changes and primordial content are in opposite phases (Figure 2). After a style change, PC should decline because the novelty of the style itself brings a high degree of arousal.

On the examples of Picasso's 16 female portraits in our research, this part of the assumption of evolutionary theory is not confirmed everywhere. Oscillations exist, but they do not coincide with the beginnings of new periods. Only in the portraits of synthetic cubism (portraits 13-16) is the decline of PC visible with the establishment of this style.

The reason for such findings can be primarily of a methodological nature. The small number of stimuli within each period (only 4) is not enough to register such changes. Another reason may lie in the specifics of the painting genius Pablo Picasso, who in each new painting brings something new that significantly deviates from the already established style.

We also assumed that the evaluations of Picasso's female portraits from the blue and pink period (portraits 1-8) will differ significantly from the portraits of analytical and synthetic cubism (portraits 9-16). Cubist paintings should have a higher arousal, but above all a higher primordial content. Picasso's cubist paintings approach abstraction in contrast to the realistic paintings of the blue and rose period. They seem surreal, supernatural and otherworldly. The assumption was made based on some earlier research (Martindale, 1990; Milicevic, 2005; Milicevic & Jovancevic, 2019). The obtained results confirm this assumption. Starting from the ninth portrait, the primordial content grows rapidly and is significantly higher than in the realistic portraits of the blue and pink periods. Arousal also increases, but somewhat more moderately

One of the limitations of this research pertains to the representativeness of the sample of stimuli and the sample of respondents. For more reliable results, it is recommended to include a larger number of female portraits from different periods of Pablo Picasso's creative work, as well as those from lesser-known periods. Additionally, future researchers should consider including other types of paintings besides female portraits, such as male portraits, children's portraits, still lives, group scenes, and more. Furthermore, it is important to remember that the periods in an artist's work overlap, blend, and separate, so care must be taken to select paintings that are true representatives of a specific creative period.

The respondents in this study were mostly without artistic education, and only a small number of them were engaged in art. Future research could aim to create a representative sample of respondents balanced between those with and without artistic education or between those who engage in art and those who do not. Considering that artists have a different perspective on art, including the artistic population in the sample could yield results that resolve existing ambiguities and contradictions in current research. Additionally, female respondents constituted the majority of the sample. This could also encourage future researchers to include a gender-balanced sample to determine whether men and women have identical aesthetic experiences or if their artistic experiences are influenced by gender differences.

Conclusion

The results of this study are consistent with previous research. They largely confirm the assumptions of evolutionary theory. Martindale was primarily engaged in empirical research of stylistic changes during long periods of art history of different cultures using a large number of stimuli. Our results confirm that the laws of the theory of aesthetic evolution can also be applied in the field of individual artistic careers, and this reflects the contribution of our research. The dynamics of expression of arousal potential and primordial content is also visible in the example of female portraits during the four periods of Picasso's individual artistic career.

The obtained results do not fully confirm all the assumptions of Martindale's theory. This especially refers to the possibility of recording the beginnings of new microstyles in Picasso's oeuvre. The obtained results do not represent anything new in relation to the subjective claims of numerous theorists and art historians. However, the greatest value of this study and similar studies lies in the fact that the conclusions were reached empirically.

Given that previous studies do not fully confirm Martindale's theory of aesthetic evolution, it is necessary to conduct more detailed and thorough research, including qualitative studies, in order to delve deeper into the issue of aesthetic experience.

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Ispitivanje estetskih procena ženskih portreta u stvaralaštvu Pabla Pikasa

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Apstrakt

Zadatak ove studije bio je da se ispita da li se estetske procene ženskih portreta iz različitih slikarskih perioda u opusu Pabla Pikasa razlikuju u pogledu potencijala pobuđenosti (AP) i primordijalnog sadržaja (PC). Pored toga, ova studija ispituje trendove estetskih evaluacija u vremenskoj perspektivi, odnosno da li one odgovaraju pretpostavkama evolucione teorije Kolina Martindejla (1990). Istraživanje je sprovedeno na prigodnom uzorku od 55 odraslih osoba ($M = 23.9$ godina, $SD = 2.46$). Stimusni materijal se sastojao od 16 (4x4) ženskih portreta koji pripadaju Pikasovom plavom periodu, ružičastom periodu, analitičkom kubizmu i sintetičkom kubizmu. Za merenje estetskih procena korišćene su skale potencijala pobuđenosti (AP) i primordijalnog sadržaja (PC). Rezultati jednosmerne ANOVA pokazuju statistički značajne razlike u ekspresiji AP ($F(3,876) = 44.16, p = .000, \eta^2 = .142$) i PC ($F(3,876) = 176.61, p = .000, \eta^2 = .388$) u zavisnosti od Pikasovog umetničkog perioda. Post hoc Tukey test je pokazao statistički značajne razlike u vrednostima ovih dimenzija između pojedinih perioda. To znači da estetske ocene ispitanika jasno razdvajaju ova četiri perioda. Takođe, razmatrani su trendovi estetskih procena ženskih portreta iz različitih perioda stvaralaštva Pabla Pikasa u funkciji vremena, odnosno redosleda nastajanja portreta. Statistički značajan očekivani trend umerenog linearnog rasta dobijen je u procenama AP ($R^2 = .566, F(3,876) = 44.2, p < .001$). U proceni PC ($R^2 = .897, F(3,876) = 177, p < .001$) trend je takođe značajan, ali pri interpretaciji rezultata treba biti oprezan zbog malog broja stimulusa u svakom periodu. Neophodno je sprovesti detaljnije istraživanje, na većem uzorku ispitanika, ali i sa većim uzorkom stimulusa. Takođe bi bilo korisno sprovesti kvalitativnu analizu kako bi se dublje ušlo u problem estetskog iskustva i uporedili rezultati sa tvrdnjama teoretičara i istoričara umetnosti.

Ključne reči.: potencijal pobuđenosti, primordijalni sadržaj, ženski portreti, Pablo Pikaso

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The Mediating Role of Leader-Member Exchange in the Relationship between Organizational Justice and Job Insecurity¹

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Abstract

This study delves into the context of organizational settings by exploring the role that organizational justice (OJ) and leader-member exchange (LMX) can have on perceived job insecurity (JI). This study was based in the theoretical perspective of Uncertainty Management Theory (UMT). The sample comprises 357 workers from the Balkan region, with most of them (64.7%) working in private companies. Findings showed that dimensions of organizational justice (distributive, procedural, interpersonal, informational) and LMX have significant positive correlations, while organizational justice has a significant negative correlation with JI. Furthermore, mediation analysis showed that relations between the dimensions of organizational justice and JI were partially mediated by LMX. The theoretical implications of this study serve to further understand the potential role LMX may have in an organizational environment and to further expand Uncertainty Management Theory. The practical implications of this study could contribute to both employees' well-being and better work-related outcomes. Future research avenues are discussed.

Keywords: organizational justice, leader-member exchange, job insecurity, uncertainty management theory

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The Mediating Role of Leader-Member Exchange in the Relationship between Organizational Justice and Job Insecurity

In today's rapidly changing organizational environment, job insecurity has become a near universal organizational phenomenon (Lee et al., 2006). Greenhalgh and Rosenblatt (1984, p. 438) describe Job Insecurity (or JI) as a "perceived powerlessness to maintain desired continuity in a threatened job situation". Another definition of JI is that it is a perceived threat to the continuity and stability of employment with such a perception being based on the current experience that the worker is having (Shoss, 2017). The nature of JI has been commonly noted to be two-fold. Mainly, there are two distinct points of view: qualitative and quantitative. The qualitative point of view places JI as a threat in the sphere of employment relationships (Hellgren et al., 1999) and emphasizes the perception of an employee regarding job related conditions. If the employee perceives that job related conditions do not match what he believes is adequate, JI may occur consequently. According to multiple studies (Boswell et al., 2014; Folkman & Lazarus 1985) conditions which are viewed as threats (the conditions that have potential to be harmful or incur loss) lead to higher levels of JI. The quantitative point of view holds the qualitative one in its core, but further expands the potential of possible events which can induce a high level of JI. This point of view proposes that it is necessary to take into account all possible (and different) aspects that may lead to an increase, or to a pronounced level, of JI in employees (De Witte 2005; Sverke & Hellgren, 2002). One of such aspects may be a lack of organizational justice perceptions.

Organizational justice refers to the perspective of what is fair in an organizational environment (Greenberg & Colquitt, 2013). Organizational justice has four dimensions: distributive justice, procedural justice, interactional justice and interpersonal/informational justice.

Distributive justice refers to people's perceptions of the fairness of distributions of rewards or resources (Homans, 1961). Such resources can be either tangible (e.g. money) or intangible (e.g. love). Distributive justice perceptions are based on processes of comparison with others, with comparisons being undertaken in two factors – outcomes and inputs. Outcomes refer to what people (or in this case, workers) receive from their place of work (such as salary, benefits, status or rewards). Input refers to people's (or workers') contributions to their work (work experience, effort, the quality and quantity of produced products, etc.). If workers perceive that they are being treated fairly and receive adequate rewards, they feel more loyal to the organization of which they are a part of (Cropanzano et al., 2007).

Procedural justice refers to the perceived fairness of the manner in which outcomes are determined (Greenberg & Colquitt, 2013). Procedural justice is defined as having a voice in proceedings (Thibaut & Walker, 1976). Having a voice means that the person has the capacity to influence outcomes (not necessarily determine them). In addition to voice, Leventhal (1980) adds more factors to procedural justice such as: consistency, bias suppression, accuracy, correctability, representativeness and ethicality. In an organizational environment, if workers have the perception

that the decision-making procedure is fair, they tend to show greater loyalty and contribution to the interests of both leaders and organizations (Vanić et al., 2019).

Interactional justice states that people consider fairness in terms of the manner in which outcomes and procedures are explained (Bies, 2001). These authors argue that people (or workers) demand adequate explanations which are presented in a dignified and respectful manner; as such, these explanations are perceived to be fair. If such demands are not met, workers believe that they have been treated poorly and as a result their expectations have been violated. Interactional justice has been shown to successfully mitigate employees' negative reactions to distributive and/or procedural injustices (Greenberg, 1990a, 1994, 2006b). Also, it is considerably easier for managers (or team leaders) to promote this type of justice, given how they have more opportunities to do so (Greenberg, 2009b).

Interpersonal/informational justice refers to the treatment of people (in this case, workers) with dignity and respect (Greenberg & Colquitt, 2013). Such a treatment can demonstrate that leaders care about their subordinates' (or team members) personal feelings and well-being. This form of justice refers to the process of giving workers (or people) clear and thorough explanations about the procedures which are used in order to determine outcomes (Greenberg & Colquitt, 2013).

According to Greenberg (1996), there exist a plethora of opportunities to judge fairness (or justice) in an organizational environment, with far reaching implications. This judgment plays a deciding role in how workers feel about their jobs (or organizations) and the way which they approach doing their job. If the judgment is negative, the workers in question feel like they have not been treated fairly or that they are victims of organizational injustice. Proof of this can be found in studies done by Törestad (1990) and Fitness (2000), in which being treated unfairly was the most identified work-related aspect that made workers feel enraged. According to a study done by Skarlicki and Kulik (2005) the worker does not even have to be the one that is being treated unfairly. Uninvolved parties that have the opportunity to observe others who are not being treated fairly report adverse emotional reactions to such situations. According to Karnes (2009), unethical behavior by organizations can lead to doubts in the employer-employee relationship and the most important ethical concern is organizational justice. Organizational justice is a fundamental value of an organization (Rawls, 1971) and can therefore influence employees' perception of JI.

There have been various studies which examined the relationship between organizational justice and JI. A study which examined this relationship showed that the relationship between these two variables does not seem to be direct (Loi et al., 2012). Another study (Chowwen & Ivensor, 2009) examined this relationship and found that the procedural dimension of organizational justice had a significant impact on the level of JI. In a recent study done by De Angelis et al. (2021) results showed that organizational justice has a buffering effect between JI and job performance. The most concrete evidence of this relationship can be found in a meta-analysis study done by Chang and Chen (2008). In this study it was noted that a perspective which emphasizes the lack of procedural justice increases JI. Furthermore, both interactional and interpersonal/informational justice may diminish the impact of JI,

as it was found that sharing information about organizational and group goals and/or including employees in decision making and problem-solving aspects, serves as a boost or an increase in employees' perceptions of control which can reduce JI perceptions. With the results from these studies in mind and within the framework of Uncertainty Management Theory, we propose organizational justice as an important antecedent of job insecurity.

Another aspect which has recently been brought into attention is the possible effect of leader-member exchange (LMX) on JI. According to our knowledge, such a notion has not been thoroughly examined and researchers (Wang et al., 2019) have called for a further investigation of this possible connection.

The leader-member exchange (LMX) paradigm focuses on the dynamics of interpersonal relationships between the team leader and team members in organizational hierarchies (Dansereau et al., 1975). The relationship between leader and member is dyadic in nature. The meaning of this can be interpreted as such that each member of a work-group can have different types (or better put, quality) of relationships with the team leader. According to Graen and Uhl-Bien's work (1995) every dyadic interaction is situated in the backdrop of diverse LMX relationships. The different qualities of LMX relationships are formed based on the leader's behavior in general, which means that those behaviors are varied in nature. Graen and Uhl-Bien (1995) propose that the behaviors of exchange between a group leader and work-group members led to distinct qualities in their relationship. The impact of LMX on work outcomes is thought to be in line with the very nature of such relationships and the rapport which a leader forms with the entirety of the work-group (Eisenbeiss et al., 2008). Given that every relationship can be of either higher or lower quality, Henderson et al. (2009) came up with the phrase – LMX differentiation. LMX differentiation refers to the dynamic and interactive exchanges that occur in the LMX relationships. The nature of such interactions may differ from dyad to dyad within the whole work-group (Henderson et al. 2009).

A study which was done by Park et al. (2015) tested whether a change in organizational justice would have a positive or negative effect on future LMX (with the current organizational justice level being held constant). Study results show that a better perception of organizational justice led to a higher quality LMX relationship, posting the idea that organizational justice may be a predictor of LMX. Such a notion was confirmed in a study done on home soil with three dimensions of organizational justice being statistically significant predictors of LMX (Vanić et al., 2019). Subsequent studies have proposed the idea that LMX may act as a mediator between organizational justice and work-related outcomes. LMX has shown to be a successful, both partial and complete mediator of organizational justice in relations to work performance (Wang et al., 2010), organizational citizenship behavior (Burton et al., 2008), work-engagement (Hassan & Jubari, 2010), psychological well-being and creativity (Abbas et al., 2021), voluntary learning behavior (Walumbwa et al., 2009), employee engagement (Samad et al., 2022) and many others. One interesting study (Loi et al., 2012) proposed that high levels of organizational justice and an ethical leader can play a role in coping with one's perceived job insecurity. This

brought into question the relationship between LMX and job insecurity. A study by Wang et al. (2019) demonstrated results which show that the relationship between LMX and JI may be boundary. According to the authors, this omission represents a gap in the literature as social environments could play a role in how work stressors are perceived, one of which being perceived job insecurity. Furthermore, the authors propose that LMX may be involved in the shaping of perceived job insecurity, with high quality LMX relationships diminishing the negative view of perceived job insecurity. The mentioned studies reveal that both organizational justice and LMX may play a role in attenuating the impact of perceived job insecurity. Additionally, it was revealed that LMX and perceived job insecurity may have a boundary relationship. Furthermore, it was demonstrated that LMX can mediate organizational justice impact. Therefore, drawing on the Uncertainty Management Theory (UMT) we proposed that JI may be influenced by four dimensions of organizational justice (distributive justice, procedural justice, interpersonal justice and informational justice) and that such an influence may be mediated by LMX. In line with our insights this is the first study that attempts to unearth the link between all of the dimensions of organizational justice and JI seeing how previous studies took into account one or two of the mentioned dimensions.

Theoretical Perspective and Hypothesis

To tie all the mentioned variables together we rely on Uncertainty Management Theory. Uncertainty management theory (Lind & Van den Bos, 2002) recognizes that fairness (or justice) is closely linked to perceived uncertainty. This is because individuals (or in this case, workers) tend to rely on fairness information when they face situations that hold a degree of uncertainty. According to this theory, workers need a certain amount of predictability. Therefore, they tend to focus on available environmental cues which can reduce the uncertainties that arise in their lives (and workplace). One of such cues is fairness or organizational justice. According to Tyler and Lind (1992), employees look for fairness information in order to determine whether they are valued members of the organization of which they are a part of. Expanding on this, Lind (2001) proposes that fairness information is used by the workers in order to determine whether or not they should identify with the organization to which they belong (if they do identify, this information also serves to determine the quantitative aspect of how much they should identify with the organization). Thau et al. (2007) acknowledge that fairness information may become very important for employees who possess a high level of uncertainty. This is because fairness (or justice) plays a role in reducing employees' anxiety about the possibility of exclusion or exploitation of the organization to which they belong (Lind & Van den Bos, 2002). Therefore, it is unsurprising that in a study done by Colquitt et al. (2006) results reveal that fair treatment makes workers feel that future events are more predictable and controllable. This kind of perceived control should help to reduce employee uncertainty about job continuity. From the four dimensions of organizational justice,

it is believed that procedural justice has the strongest link to JI. Previously mentioned researchers, namely Lind and Tyler (1988) proposed that procedural justice acts as a signal to employees about their status and standing in their respective organization. In particular, it was shown that employees who perceive greater procedural justice have a stronger sense that they are respected and valued members of the organization (Cropanzano & Byrne, 2001). Therefore, they should have less uncertainty (or JI) about their work position in their organization. As for the other dimensions of organizational justice, research done by Masterson et al. (2000), suggests that the quality of the relationship between employees and their organizations, as well as their relationship with their leader (or supervisor) acts as a mediator of the effects of fairness (organizational justice) perceptions on employee outcomes. Furthermore, Masterson et al. (2000) propose that acts of fairness work as contributions that enhance the quality of ongoing relationships. These relationships affect both organizational and leader relationships. It is believed that these contributions create obligations for employees, where they feel a need to reciprocate the source of the fair treatment as a means of preserving the quality of different relationships. This work, in combination with the work done by multiple different authors (Cropanzano et al., 2002; Rupp & Cropanzano, 2002), support the notion (or perspective) by demonstrating that LMX links leader-referenced justice perceptions (or, as it is more popularly defined - interactional justice) to employee outcomes, therefore putting LMX in a mediator role between them. In these papers (Cropanzano et al., 2002; Rupp & Cropanzano, 2002), it was also found that organizational exchange relationship perceptions can influence organization-referenced justice perceptions (or as we defined them – procedural justice and distributive justice), therefore impacting employee outcomes. In a study done by Takeuchi et al. (2012) results show that there is a high impact of organizational justice dimensions on uncertainty outcomes. The study was based on Uncertainty Management Theory. Two more studies which focused on the effect organizational justice has on JI and uncertainty (Loi et al., 2012; Wolfe et al., 2018) confirm the effect within the theoretical framework of Uncertainty Management Theory. As we mentioned earlier, a study done by Wang et al. (2019) proposed the idea that LMX may mediate JI, and called for further exploration of this possibility. With mentioned links between organizational justice, LMX and JI, and using the theoretical framework of Uncertainty Management Theory we want to answer these calls and expand the literature on this particular topic which has so far been under-investigated. Therefore, we propose the following hypothesis:

H1: The relationship between distributive justice and job insecurity will be mediated (partially or fully) by LMX.

H2: The relationship between procedural justice and job insecurity will be mediated (partially or fully) by LMX.

H3: The relationship between interpersonal justice and job insecurity will be mediated (partially or fully) by LMX.

H4: The relationship between informational justice and job insecurity will be mediated (partially or fully) by LMX.

Method

Sample and Procedure

The sample comprises 357 respondents (60.2% of which are female), with the age range being from 19 to 67 years ($M=36.10$; $SD=9.80$). A large number of the surveyed employees have stated that they have higher education degrees, starting from bachelor's at 31.4% then master's studies at 33.6% and lastly 9.2% for postgraduate studies. There were notably fewer employees with a high school degree (19.3%) than those with higher schooling. Most of the respondents live in either a large or smaller urban area (91.9%) with the rest living in rural areas. Employment contract duration has also been taken into account, with most of the respondents claiming that they are employed for an indefinite period of time (80.7%). The average working experience (calculated by years of work) is 10.39 years ($SD=8.34$), with the largest work experience being 36 years, and the lowest being 1 year of work experience. Most of the employees stated that they work in a private company (64.7%), while the rest work in organizations in the public sector. In general, the spread of jobs that the employees do is heterogeneous. This research is a part of a larger study conducted on the same sample, which explored topics in an organizational context. We obtained our sample via online survey (using convenience sampling). The study was conducted from July to September of 2023 in a Serbian language speaking area. A page which explained the purpose of study, anonymity of the results and the terms and conditions of the study was set up. Before the respondents were able to fill in the results they were asked if they agreed with the mentioned terms. All of the respondents volunteered to take part in this study.

Measures

Organizational Justice Scale (Colquitt, 2001; adaptation by Mirković, 2014). This study used the multi-dimensional questionnaire to determine employees' perception of organizational justice. The dimensions of the questionnaire are: distributive justice, procedural justice, interactional justice and informational justice. The entire questionnaire consists of 20 statements, with responses being given on a 5-point Likert scale, ranging from 1 = "*I completely disagree*" to 5 = "*I completely agree*". Example of an item "The level of compensation reflects the effort that I put into my work". The author of the adaptation (Mirković, 2014) noted that Cronbach's internal consistency of the entire scale is $\alpha = .93$, with the dimensions of organizational justice having the following Cronbach values – distributive justice $\alpha = .91$, procedural justice $\alpha = .87$, interactional justice $\alpha = .92$, informational justice $\alpha = .94$.

Member Exchange Questionnaire (LMX-7; Graen/Uhl-Bien 1995, adaptation by Strukan, 2019). To determine the quality of LMX, this study used a one-dimensional questionnaire. The questionnaire consists of 7 statements with responses being given on a 5-point Likert scale, ranging from 1 = "*I completely*

disagree” to 5 = “*I completely agree*”. Example of an item “To which degree are you informed about how satisfied or unsatisfied your leader is with your work?”. The author of the adaptation (Strikan, 2019) noted that Cronbach’s internal consistency of the questionnaire is $\alpha = .88$.

Perceived Job Insecurity Questionnaire (Silbereisen/Reitzle/Pinquant, 2006; adaptation by Todorović, 2015), was used in order to determine the level of JI. This is a one-dimensional questionnaire. The questionnaire consists of 5 statements with responses being given on a 5-point Likert scale, ranging from 1 = “*I completely disagree*” to 5 = “*I completely agree*”. Example of an item “There is a greater risk of losing my job”. The author of the adaptation (Todorović, 2015) noted that Cronbach’s internal consistency of the questionnaire is $\alpha = .80$.

Data Analysis

To analyze the data, we used the IBM SPSS Statistics for Windows, version 26.0. We used the following descriptive statistics - mean, standard deviation, percentages, skewness, and kurtosis, correlation techniques – Pearson’s correlation coefficient. Mediation analysis was done by an extension program for SPSS named PROCESS (Hayes, 2012). Indirect effects were considered significant if the 95% bootstrap confidence interval (CI) did not include the value 0 ($p < .05$) (Preacher & Hayes, 2008).

Results

Descriptive statistics are presented in Table 1 and the results of the correlation analysis in Table 2.

Table 1

Results of descriptive statistics of the variables used in the study

Variables	<i>Min</i>	<i>Max</i>	<i>M</i>	<i>SD</i>	<i>Sk</i>	<i>Ku</i>	α
Organizational justice	1.20	5.00	3.38	.85	.07	-.65	.94
Distributive justice	1.00	5.00	3.12	1.3	-.24	-1.2	.96
Procedural justice	1.00	5.00	2.91	1.0	.96	-.61	.90
Interpersonal justice	1.42	5.00	4.06	.83	-.82	.47	.88
Informational justice	1.00	5.00	3.68	.94	-.45	-.68	.89
LMX	1.14	5.00	3.75	.94	-.46	-.68	.87
Job insecurity	1.00	5.00	2.25	.86	.51	-.15	.72

Note. *M* – mean; *SD* – standard deviation; *Sk* – Skewness (distribution asymmetry coefficient); *Ku* – Kurtosis (distribution asymmetry coefficient); α – Cronbach’s alpha reliability coefficient of internal consistency.

Most of the distributions are negatively skewed, indicating that the answers for questionnaire particles have a tendency to be higher. The values of the Kurtosis suggest that the distributions are not pronounced at their extremes, but this is not problematic because the values are far from the critical limit (+/- 2), for this parameter, which indicates the distribution is normal. The values of Cronbach's alpha reliability show that all questionnaires (and dimensions) reach the necessary threshold of reliability which is supposed to be $< .70$. Most of the mentioned Cronbach values are in line with what the authors who adapted the questionnaires have noted in their studies.

Results from the correlation analysis show that all of the dimensions of organizational justice are positively correlated to each other (Table 2). Furthermore, all dimensions of organizational justice also have a positive correlation with LMX. These results show that a higher level of justice is linked to a better (or higher) quality relationship between subordinate and leader. Lastly, both LMX and the dimensions of organizational justice have significant negative correlations with job insecurity.

Table 2

Intercorrelation between the variables using Pearson's correlation coefficient

	Organizational justice	Distributive justice	Procedural justice	Interpersonal justice	Informational justice	LMX
Organizational justice						
Distributive justice	.79***					
Procedural justice	.92***	.70***				
Interpersonal justice	.65***	.26***	.48***			
Informational justice	.82***	.47***	.65***	.61***		
LMX	.66***	.46***	.54***	.54***	.65***	
Job insecurity	-.49***	-.31***	-.39***	-.43***	-.51***	-.49***

Note. **statistically significant at $p < 0.01$; ***statistically significant at $p < 0.001$.

We will examine our postulated hypothesis of the mediating role that LMX may have in the relationship between the dimensions of organizational justice and job insecurity. The following tables hold these predictors: distributive justice - Table 3, procedural justice – Table 4, interpersonal justice – Table 5 and lastly, informational justice – Table 6.

Table 3*Indirect, direct and total effects of distributive justice on job insecurity through LMX*

Mediator	<i>a</i>	<i>b</i>	<i>ab</i>	<i>c'</i>	<i>c</i>	Confidence interval	
LMX	.458***	-.447***	-.205***	-.109**	-.204***	-.262	-.152

Note: *a* – effect of the predictor on the mediator; *b* – the effect of the mediator on the criterion; *ab* – indirect effect of the mediator in the relationship between predictor and criterion; *c'* – direct effect of the predictor on the criterion when the effect of the mediator is controlled; *c* – total effect; fully standardized effects were used; *** $p < .001$, ** $p < .005$.

The result from the mediation analysis shows that the effect that distributive justice has on LMX is positive and that the effect LMX has on job insecurity is negative (Table 3). The direct effect that LMX has on job insecurity when distributive justice is controlled is negative, with confidence intervals showing that the impact is significant. The direct effect distributive justice has on job insecurity is negative and significant, with the total effects of the entire model being negative and significant. These results show that LMX is a partial mediator in the relationship between distributive justice and job insecurity.

The result from the mediation analysis shows that the effect that procedural justice has on LMX is positive and that the effect LMX has on job insecurity is negative (Table 4). The direct effect that LMX has on job insecurity when procedural justice is controlled is negative, with confidence intervals showing that the impact is significant. The direct effect procedural justice has on job insecurity is negative and significant, with the total effects of the entire model being negative and significant. These results show that LMX is a partial mediator in the relationship between procedural justice and job insecurity.

Table 4*Indirect, direct and total effects of procedural justice on job insecurity through LMX*

Mediator	<i>a</i>	<i>b</i>	<i>ab</i>	<i>c'</i>	<i>c</i>	Confidence interval	
LMX	.542***	-.399***	-.216***	-.181***	-.326***	-.280	-.157

Note: *a* – effect of the predictor on the mediator; *b* – the effect of the mediator on the criterion; *ab* – indirect effect of the mediator in the relationship between predictor and criterion; *c'* – direct effect of the predictor on the criterion when the effect of the mediator is controlled; *c* – total effect; fully standardized effects were used; *** $p < .001$, ** $p < .005$.

Table 5

Indirect, direct and total effects of interpersonal justice on job insecurity through LMX

Mediator	<i>a</i>	<i>b</i>	<i>ab</i>	<i>c'</i>	<i>c</i>	Confidence interval	
LMX	.547***	-.373***	-.204***	-.226***	-.445***	-.275	-.143

Note: *a* – effect of the predictor on the mediator; *b* – the effect of the mediator on the criterion; *ab* – indirect effect of the mediator in the relationship between predictor and criterion; *c'* – direct effect of the predictor on the criterion when the effect of the mediator is controlled; *c* – total effect; fully standardized effects were used; ****p*<.001, ***p*<.005.

The result from the mediation analysis shows that the effect that interpersonal justice has on LMX is positive and that the effect LMX has on job insecurity is negative (Table 5). The direct effect that LMX has on job insecurity when interpersonal justice is controlled is negative, with confidence intervals showing that the impact is significant. The direct effect interpersonal justice has on job insecurity is negative and significant, with the total effects of the entire model being negative and significant. These results show that LMX is a partial mediator in the relationship between interpersonal justice and job insecurity.

Table 6

Indirect, direct and total effects of informational justice on job insecurity through LMX

Mediator	<i>a</i>	<i>b</i>	<i>ab</i>	<i>c'</i>	<i>c</i>	Confidence interval	
LMX	.654***	-.281***	-.184***	-.330***	-.469***	-.255	-.112

Note: *a* – effect of the predictor on the mediator; *b* – the effect of the mediator on the criterion; *ab* – indirect effect of the mediator in the relationship between predictor and criterion; *c'* – direct effect of the predictor on the criterion when the effect of the mediator is controlled; *c* – total effect; fully standardized effects were used; ****p* < .001, ***p* < .005.

The result from the mediation analysis shows that the effect that informational justice has on LMX is positive and that the effect LMX has on job insecurity is negative (Table 6). The direct effect that LMX has on job insecurity when informational justice is controlled is negative, with confidence intervals showing that the impact is significant. The direct effect informational justice has on job insecurity is negative and significant, with the total effects of the entire model being negative and significant. These results show that LMX is a partial mediator in the relationship between informational justice and job insecurity.

Discussion

The conceptual framework that we have proposed suggests that the quality of the relationship between the way employees perceive organizational justice and their relationship with their work-group leader (LMX) have a significant impact on how

they perceive organizational outcomes, specifically perceived job insecurity (JI). Building on previous research which postulates that organizational justice may play a role in diminishing employees' perception of JI, and answering the call of authors to further explore the relationship between LMX and JI, we proposed a number of hypotheses to test these assumptions.

The first hypothesis we proposed positions LMX as a mediator in the relationship of distributive justice and JI. The results show that LMX was a partial mediator in the relationship, meaning that both LMX and distributive justice had a significant negative effect on JI. These findings are in line with what Cropanzano et al. (2007) suggested, and confirms that the perception of distributive justice within an organizational setting can have a massive effect on how the workers feel about their work and company. If they perceive that they are being treated fairly (in comparison to others) and receive adequate rewards, they are more loyal to the organization of which they are a part of. Additionally, this study has managed to identify that the role LMX has when it comes to JI is significant and negative, meaning that higher quality relationships between employees and their work-group leader acts as a factor in lowering perceived JI levels, which may have an effect on ongoing discourse surrounding the crucial role of leadership quality in employees' well-being.

The second hypothesis we proposed positions LMX as a mediator in the relationship of procedural justice and JI. The results show that LMX was a partial mediator in the relationship, meaning that both LMX and procedural justice had a significant negative effect on JI. These findings are in line with the findings of previous studies (Loi et al., 2012; Takeuchi et al., 2012; Wolfe et al., 2018). We believe that this is because the employees' perception of having the ability or opportunity to voice their opinions on multiple different aspects of job-related propositions makes them feel more comfortable and valued as a part of their respective organization. Such a feeling reduces the perception of potentially losing one's job.

The third hypothesis we proposed positions LMX as a mediator in the relationship of interpersonal justice and JI. The results show that LMX was a partial mediator in the relationship, meaning that both LMX and interpersonal justice had a significant negative impact on JI. These findings are in line with previous studies (Greenberg, 1990a, 1994, 2006b; Greenberg & Colquitt, 2013). The findings that were obtained in our study suggest that when employees receive treatment from their work-group leaders that is based in dignity and respect they tend to feel less anxious about their job position. The relationship that interpersonal justice achieved with LMX is also something that has been noted in literature (Greenberg & Colquitt, 2013). Given how the relationship between leader (or manager) and subordinate is dyadic and situated in the backdrop of diverse LMX relationships (leaders have different relationships with all of their subordinates), leaders have more opportunities to promote this type of justice. Therefore, it is believed that it is easier to promote interpersonal justice (Greenberg, 2009b) and efforts to make this type of justice a focal point in creating a healthier work environment should be considered.

The fourth hypothesis we proposed positions LMX as a mediator in the relationship of informational justice and JI. The results show that LMX was a partial

mediator in the relationship, meaning that both LMX and informational justice had a significant negative impact on JI. This is in line with what Greenberg and Colquitt (2013) proposed. According to our knowledge, we do not have any relevant studies on this topic. We believe that the direct relationship between informational justice and JI is due to the fact that having more valid/precise information about organizational outcomes can reduce employees' anxiety about their position within an organization, therefore lowering employees' perception of JI. The connection between this type of justice and LMX seems obvious, as it is mostly down to the leaders to share such information. Furthermore, if the manner in which they do so is perceived to be respectful then both the relationship with the leader (positively) and JI (negatively) will be impacted.

Lastly, we found that LMX does indeed play a mediator role in the relationship between organizational justice and JI, as it was shown that JI is lower when LMX is higher (when there is a high-quality leader-member relationship). A notion to explore this particular relationship was called for by authors (Wang et al., 2019) and we believe that these results could answer the posed questions and clarify the relationship between the two constructs. Additionally, these findings support earlier work of authors who found that LMX mediated the relationship between organizational justice (procedural, distributive and interactional) and organizational outcomes (Cropanzano et al., 2002; Masterson et al., 2000; Rupp & Cropanzano, 2002).

From a theoretical standpoint this study adds a new viewpoint to the literature by answering the calls of researchers to explore the relationship that LMX may have with JI. Study findings serve to further understand the potential role LMX has in an organizational environment, opening possibilities for further exploration of the effect it might have (in both practical and theoretical terms). Additionally, study results contribute to the growing literature relying on Uncertainty Management Theory framework by illuminating the role that LMX has in the relationship between organizational justice and JI. These findings serve to advance the theoretical standpoint by understanding how leaders can impact and shape employees' job experience (and therefore, organizational success). The interplay between organizational justice and LMX provides a valuable insight into factors which can play protective roles in spheres of both workplace well-being and organizational success. Further exploration of this relationship is necessary in order to confirm these findings. Future research avenues may include other ethical concerns and organizational variables such as perceived organizational support, organizational social responsibility, organizational citizenship behavior, turnover intentions, organizational commitment, well-being, current worker affect state, burnout etc.

From a practical standpoint, these findings suggest the role that leaders can have in shaping work-related outcomes, therefore organizations should focus on having their leaders engage in respectful and open relationships (and communication) with their subordinates – with such relationships being truthful in nature. Additionally, the possibility that employees may voice their opinions and their opinions be heard and taken into account, can serve to increase their loyalty to the organization of

which they are part of. This can lead to an environment where both concerns and challenges can be openly discussed. Organizations should invest in programs that will teach their leaders to not only communicate better but also acquire skills which can help in recognizing potential signs of stress in their subordinates, and deal with such matters in a timely manner. Therefore, we propose that a holistic approach should be adopted which we believe can lead to a better and more healthy work environment.

This study, although it makes significant contributions to the understanding of the proposed concepts and their relationship is not without limitations. The sample size, even though it is considerably large, can be increased in future research and there may be some concerns about its heterogeneity. Although it offers a decent amount of diversity, the sample could introduce potential confounding factors that may influence results, with the biggest being the possibility to generalize these results. Therefore, we believe that a specific, homogenous sample could address these concerns. Furthermore, the study sample consists only of respondents who were willing to partake in the study, with no type of probability sampling being used. Such an approach may lead to the introduction of factors which may in turn influence results. Future studies should address this issue by using some form of probability sampling. Additionally, a longitudinal approach would be valuable, as seeing how all of the variables are perception based and can be susceptible to change over time. Further points of concern are that the measures were self-reported and administered online, which means that study authors did not have the ability to oversee the respondents. It may be possible that some of them did not even read the questions and that they made multiple responses. Given that this study was a part of a larger study which consisted of a dozen variables, such proceedings present a valid point of concern. The best solution to this is a face-to-face administration of measures which we believe should be addressed in future studies. Finally, LMX is a variable which can only be assessed for workers who actually have supervisors (leaders, bosses etc.); therefore, study results cannot be generalized for workers who work solitary jobs (e.g., work for hire) or are in charge of their own company.

Conclusion

The findings of this study underscore the positive impact that both LMX and dimensions of organizational justice have in reducing the employees' perceived threat in relation to their job position. Our study aligns with existing literature about the topic in hand and also adds a new viewpoint to the topic by answering the calls of researchers to explore the relationship that LMX may have with JI. Additionally, our findings illuminate the role that organizational justice has on JI, both directly and via mediation (through LMX), which adds to the concurrent literature that has been lacking in the department of informational justice specifically. We acknowledge that the interplay of organizational justice and LMX can have interesting implications, opening a possible avenue for future research on this relationship. Therefore, we

postulate that larger, more diverse samples in following studies can add to our understanding of these concepts and organizational outcomes. Furthermore, this study contributes to the Uncertainty Management Theory by elucidating the mediating role that LMX has between organizational justice and job insecurity, thus serving the purpose of advancing the theoretical framework by providing understanding how LMX can shape organizational outcomes. From a practical standpoint our study illuminates both the protective aspects that organizational justice and LMX have in relation to one's JI, highlighting the importance of building a high-quality relationship between a leader and a subordinate. These findings can contribute to both employees' well-being and work-related outcomes. However, our study does have limitations about the heterogeneity of the sample, the cross-sectional design of the study and the way that the measures were administered. Future research should focus on obtaining a homogenous sample and a longitudinal approach, both of which would add to the understanding of these concepts while also paving the way for a more healthy and successful work environment.

In essence, our research demonstrated the interplay between organizational justice and LMX, providing valuable insight into factors which can reduce workers JI. The identification of LMX as a mediating variable which can play a protective role in determining workers JI contributes to the broader scope of literature on workplace well-being. As for future studies on this topic (and similar topics), using larger sample sizes, a more homogenous sample and a multi-method approach could serve to unravel further complexities of this relationship.

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Medijatorska uloga lider-član razmene u odnosu između organizacione pravde i percipirane nesigurnosti posla

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Apstrakt

Ova studija je sprovedena u kontekstu organizacionog okruženja putem istraživanja uloge koju organizaciona pravda i razmena lider-član (LMX) mogu imati u vezi sa percipiranom nesigurnošću posla (JI). Ova studija je zasnovana na teorijskoj perspektivi Neizvesnog Menadžmenta (UMT). Uzorak studije se sastoji od 357 radnika iz Balkanskog regiona, pri čemu većina radnika (64.7%) radi u privatnim organizacijama. Nalazi sugerišu da dimenzije organizacione pravde (distributivna, proceduralna, interpersonalna, informaciona) i LMX imaju značajne pozitivne korelacije, dok organizaciona pravda ostvaruje značajnu negativnu korelaciju sa JI. Nadalje, rezultati medijacione analize pokazuju da su odnosi između dimenzija organizacione pravde i JI delimično posredovani putem LMX-a. Teorijske implikacije ove studije služe za dalje razumevanje potencijalne uloge koju LMX može imati u organizacionom okruženju kao i za proširenje teorije Neizvesnog Menadžmenta. Praktične implikacije ove studije se tiču mogućeg doprinosa generalnoj dobrobiti zaposlenih kao i poboljšanja ishoda povezanih sa poslom. Diskutovalo se o nedostacima studije kao i budućim istraživačkim putevima.

Ključne reči: organizaciona pravda, lider-član razmena, percipirana nesigurnost zaposlenja, teorija neizvesnog menadžmenta

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Dismantling the Hype: A Systematic Review of NLP Coaching Limited Impact in Organizations¹

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Abstract

Neuro-Linguistic Programming (NLP) is an all-encompassing approach to communication and personal development, focusing on how individuals perceive their thoughts, feelings, and communications. While an increasing number of academic articles highlight the application of NLP in organizational settings and its proponents are directing more attention toward research, there remains a scarcity of studies addressing the methodological quality of research that draws such conclusions. The objectives of this paper were to examine the effectiveness of the NLP method according to research outcomes applied in an organizational context and the extent to which these methods are based on contemporary scientific methodology. PRISMA guidelines were used as the methodological approach for analyzing the studies. The focus was on research investigating the effects of applying NLP techniques on criteria related to personality variables or behavior in an organizational context. The search through research databases resulted in selecting only four articles from an initial pool of 720. Findings suggest that NLP can be effective for developing a wide range of psychological outcomes related to organizational behavior, but nearly all findings are questionable due to the poor quality of the methodology used in the research, unclear reporting, and the small number of studies that have acceptably examined these phenomena. Various shortcomings in the context of scientific theory criteria and research design are discussed, with recommendations for further research to explore the truthfulness/effectiveness of the promoted methods.

Keywords: NLP, research, methodology, organizational effectiveness, coaching

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Dismantling the Hype: A Systematic Review of NLP Coaching Limited Impact in Organizations

Neuro-Linguistic Programming (NLP) is a discipline described by its creators and practitioners as a model of human experience and communication (Linder-Pelz & Hall, 2007). The practices implemented by this program are widespread and ubiquitous worldwide (Kang et al., 2020). In recent years, its influence has also been noticeable in Serbia, particularly in the fields of business consulting, personal development, and coaching. Despite its pseudoscientific foundation, NLP has gained popularity through various training programs, workshops, and seminars aimed at improving communication and leadership skills, often promoted as a method for achieving personal and professional success. This paper aims to provide an exhaustive overview of research studies that explored the effects of applying NLP methods within an organizational context. Claims about the positive effects of this methodology are often highlighted in advertising campaigns and used as arguments by practitioners (Alder, 2017). Therefore, this work critically examines the scientific rigor and evidence, or lack thereof, supporting these practices. Researchers in the field of applied psychology often need clarification on what principles NLP operates, although it sometimes intersects with certain psychotherapeutic schools inclined toward an integrative approach (Atzil-Slonim et al., 2024).

Neuro-Linguistic Programming originated in the United States in the early 1970s as a result of research conducted by John Grinder, a University of California assistant, and Richard Bandler, a psychology student at the same university (O'Connor & Seymour, 2009). Richard Bandler, a mathematician and scientist, spent forty years studying individuals with various psychological and behavioral issues, primarily through observation, interviews, and modeling their behavior, while devising techniques based on patterns of positive outcomes. He analyzed the work of therapists and other professionals who achieved significant results, thereby refining methods that help individuals change their lives (Bandler & Grinder, 1979). Grinder and Bandler examined the works of significant and influential psychotherapists, psychiatrists, and psychologists such as Perls, Erickson, and others. Their goal was to discover patterns successful therapists use and make them accessible to others (O'Connor & Seymour, 2009).

One of the fundamental concepts in NLP is the idea of a preferred representational system (PRS). This concept posits that people create internal representations of the world by processing external stimuli through five sensory channels: visual, auditory, kinaesthetic, olfactory, and gustatory (Bandler & Grinder, 1979). Notably, the term 'kinaesthetic' within NLP peculiarly encompasses general feelings. According to the founders of NLP, Grinder and Bandler (1976), individuals tend to rely predominantly on one of these sensory systems - especially visual, auditory, or kinaesthetic - during conscious activities. This preference is evident in their speech patterns; for instance, someone who thinks visually might frequently use phrases like "I see" or "It appears to me.". Bandler and Grinder (1979) also argued that one's current representational

system could be inferred from one's eye movements, such as associating a downward gaze to the right with kinaesthetic thinking.

NLP in an Organizational Context

Perhaps the most common application of NLP techniques is in coaching, whether in an organizational or individual setting. Practitioners and researchers of this methodology report numerous outcomes that have helped major organizations enhance employee performance, increased motivation, and increased employee engagement at work (Abrams, 2004). However, these conclusions are often derived more from case studies and online articles than through any form of empirical research.

A significant focus of this methodology is on goal setting, as it is promoted as particularly effective for high-productivity goal-setting (McDermott & Jago, 2006). It advocates that well-set goals should maximize achievement by being outcome-oriented. Unlike 'SMART' goals with their advanced deliberations, this approach focuses on the five sensory domains and body movements during the execution of the goal. By doing so, individuals will be more motivated and better focused on their objectives (Kotera & Sheffield, 2017; O'Connor & Seymour, 2009; Squire, 2018).

NLP is not limited to goal-setting alone; it also encompasses other key areas such as self-management, presentation skills, negotiation techniques, interviewing tactics, team-building tools, and leadership (Grimley, 2016). For example, soliciting feedback involves adhering to one of the principles of this method: "The meaning of communication is the response you get" (O'Connor & McDermott, 2013, p. 35).

As a result, the authors of the NLP methodology published a substantial number of textbook-like books, written in a way that made them easily accessible to everyone. However, no part of the available literature explains the process of theory construction or whether it was followed by any empirical verification (Roderique-Davies, 2009). This creates an impression that the methodology is built on the subjective experiences of its authors.

Methodology of NLP Research

Although a significant number of articles and posts in journals and on various websites discuss the application of NLP in organizational contexts, there is a stark scarcity of rigorous scientific studies exploring this topic. Practitioners often reference these non-peer-reviewed sources to support their claims. For instance, Kang et al. (2020), highlighted that although NLP has been widely developed and has influenced management theories significantly, the research lacks a comprehensive review or detailed guidance on its application as an analytical technique in management research. Authors noted that by the end of 2019, 72 articles employing NLP as a focal technique were published in the UT Dallas List of 24 Leading Business

Journals. These studies failed to thoroughly explain how NLP can be utilized to enhance management theories or provide a clear, step-by-step tutorial for using NLP in data analysis.

It is important to note in a review of NLP methodology that within this field, there exists a particular school—direction—dedicated to research (Cambria & White, 2014). NLP has evolved in multiple directions, one of which is the research branch known as NLPsy (NLPpsych). It is referred to as the fourth wave, where scientific research of NLP began. This started in 2006 with the “Research & Recognition Project”. In 2012, the name NLPsy was coined for this variation of NLP by the International Association of NLP Institutes (IN-NLP) (e.g., Johannßen & Biemann, 2018). It is mentioned that the research, or NLPsy, requires the highest standard of qualification. An NLPsy Master Trainer must hold a master’s degree in psychology, qualifications in psychotherapy at the level of the World Council for Psychotherapy, and the title of NLP Master Trainer with an IN-NLP certificate. The effectiveness of NLPsy training is scientifically assessed before and after each training session.

Despite its undeniable popularity and widespread adoption, NLP has often faced serious criticisms from researchers due to its insufficient development (Grimley, 2016; Sturt et al., 2012; Thompson et al., 2002; Zaharia et al., 2015). These criticisms are not solely about poor communication between practitioners and researchers in the field but are largely directed at the quality of the methodology implemented within NLP research (Sturt et al., 2012). Some systematic reviews (Grimley, 2016) have reported a complete absence of studies meeting scientific criteria, such as those examining the effects of its application in the healthcare system, where this methodology is also frequently used. Another type of criticism relates to the difficulty of separating the effects of the method itself from skills that might have been developed through other means (Pensieri, 2013; Witkowski, 2010), suggesting a significant deficiency in the research methodology upon which conclusions have been based.

The Pseudoscientific Nature of NLP

The forthcoming analysis will employ a set of demarcation criteria to distinguish between scientific rigor and pseudoscientific approaches, as outlined by Hedrih and Hedrih (2022). These demarcation criteria encompass several key areas: First, the mode of publication, where scientific research is initially subjected to peer review and thorough expert scrutiny before being made available to the public, in contrast to pseudoscience, which often bypasses such processes to target the general audience directly. Second, the replicability of results, a cornerstone of scientific integrity, demands that methods be described with enough precision to allow independent verification, whereas pseudoscientific claims tend to obscure or omit replicable details. Third, the treatment of errors, where legitimate science acknowledges and corrects its mistakes as part of its progression, while pseudoscience tends to ignore or conceal errors, maintaining fixed beliefs. Fourth, the advancement of knowledge,

in which scientific endeavors demonstrate a clear trajectory of cumulative understanding, unlike pseudoscience, which stagnates over time. Fifth, the reliance on evidence-based arguments, distinguishing science by its use of data to support claims, whereas pseudoscience often persists despite contradictory evidence. Lastly, the rigor of testing before practical application, where scientific innovations undergo exhaustive evaluation before entering the market, unlike pseudoscientific products, which often evade such scrutiny.

NLP is widely criticized within the scientific community, with many experts dismissing it as pseudoscience. A primary argument against NLP is its marginal presence in academic psychology. It is rarely taught in universities and is notably absent from standard psychology textbooks (Heap, 2008). Critics argue that this exclusion reflects a broader consensus that NLP lacks empirical support and theoretical clarity (Witkowski, 2010). Ethical concerns compound these criticisms, with allegations that some NLP practitioners engage in manipulative behaviors and promote a guru-like culture (Grant, 2019). Additionally, NLP certifications are often criticized for their dubious credibility and commercial focus, with courses sometimes available at suspiciously low prices and completed quickly (Consoul Coaching, 2023).

The theoretical foundations of NLP are also contentious. Critics claim that its concepts, such as representational systems, are vaguely defined and not coherently integrated (Greif, 2022; Witkowski, 2010). Furthermore, NLP is accused of misinterpreting psychological and linguistic theories, including Pavlovian conditioning and Chomsky's transformational grammar (Greif, 2018). Empirical evidence does not support the effectiveness of NLP, and some studies suggest that it is no more effective than a placebo (Sharpley, 1987). The quality of supportive research is often questioned, with many studies deemed methodologically flawed (Kotera et al., 2018).

Critics label NLP as pseudoscientific due to its imprecise concepts, reliance on anecdotal evidence, and lack of rigorous empirical testing (Greif, 2022). There are also allegations that some NLP proponents exaggerate the scientific validity of their methods without sufficient evidence. These factors contribute to the perception of NLP as lacking scientific credibility and being more akin to pseudoscience than a legitimate psychological discipline. Thus, while some practitioners may genuinely seek to apply scientific principles, the broader practices and claims associated with NLP often fall short of established scientific standards.

Methodological Analysis of Studies

This paper is written as a systematic review, a type of research that serves many important functions. Systematic reviews can help synthesize knowledge in a field, identify future research priorities, address questions that individual studies cannot answer, pinpoint issues in primary research phases that need correction in

future studies, and generate or evaluate theories about the reasons for the occurrence and development of phenomena of interest to researchers. The PRISMA method, established in 2009, aids researchers in transparently reporting the reasons for the review, what the authors analyzed, and the conclusions drawn from such studies (Rethlefsen et al., 2021).

The objectives of this paper are to examine:

a) the effectiveness of the application of NLP methods in organizational context research;

b) the extent to which the methods used in these studies were based on contemporary scientific methodology.

Study Inclusion Criteria

To proceed with analyses and address the study objectives, criteria were established for pre-searching articles and including relevant studies in further analysis. Table 1 displays the criteria set for this study.

Table 1

Study inclusion and exclusion criteria

Criteria Category	Inclusion Criteria	Exclusion Criteria
Journal	Peer-reviewed studies in journals with an Impact Factor (IF) / peer-reviewed conference proceedings; articles written in English	Journals without an IF; studies written in languages other than English; studies with no information about the editorial process and peer review
Study Design	Experimental and quantitative studies	Qualitative studies, case studies, review articles, meta-analyses
Dependent Variable	Variables relevant to an organizational context (performance, management, interpersonal relations, etc.)	Variables not related to an organizational context
Independent Variable	Application of coaching and similar forms of advisory work with clients/ interventions, which are part of NLP methodology	Studies not involving NLP methods or interventions closely related to coaching or other advisory methods and NLP techniques
Sample	Employed participants, regardless of the form and duration of engagement or the type of position they hold	Unemployed participants

Literature Search

The literature search was conducted during January and February 2023, utilizing readily accessible online databases for scientific publications that do not require special access permissions, primarily through Google Scholar and ResearchGate. Additionally, results from the ScienceDirect database were included.

During the search, various combinations of terms related to NLP such as “neuro-linguistic programming,” “neurolinguistic programming,” and “neuro linguistic programming,” along with the abbreviation “NLP,” were used. Keywords also included in the search were: “research,” “coaching,” “intervention,” along with “work,” “employees,” “managers,” “business,” “organisation,” and “occupation.”

Figure 1 Graphic representation of the selection of works through the PRISMA

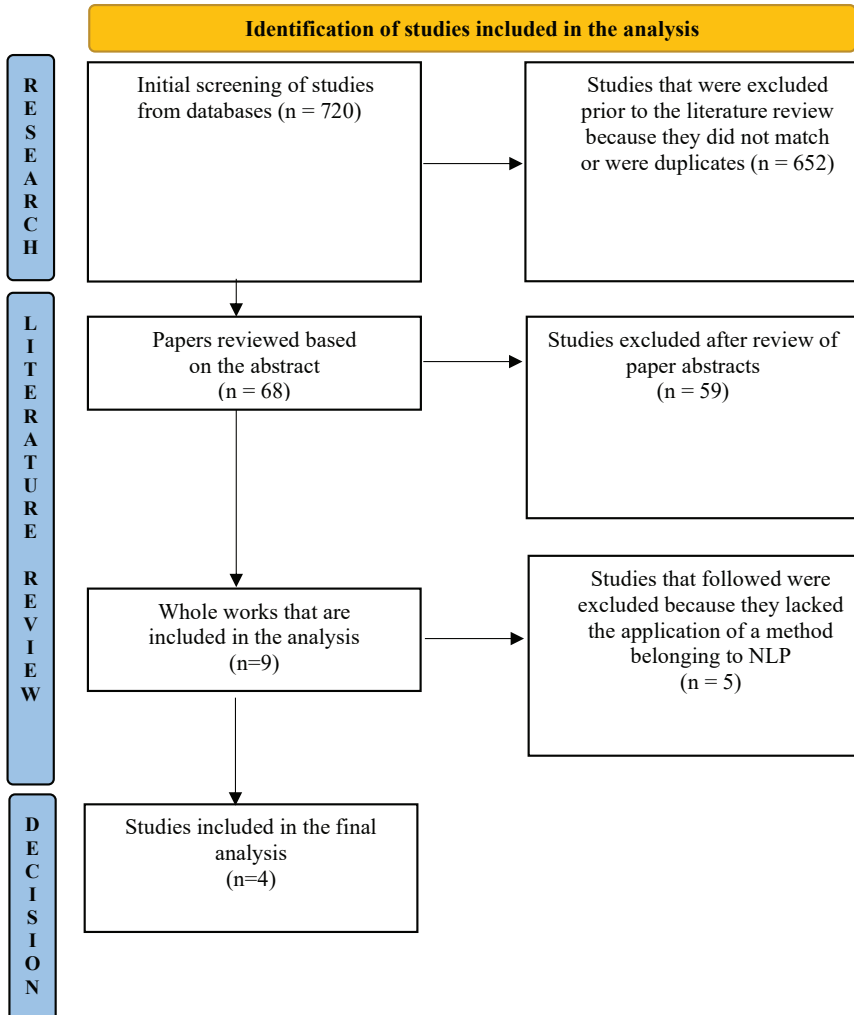


Figure 1 illustrates the process of the literature search, from the discovery of significant works to the decision on the final inclusion of studies for further methodological quality analysis.

Results

Included Studies

Table 2
Details of the Studies Included in the Final Analysis

Authors / Title	Method	Sample	Criterion	Intervention	Results
HemmatiMaslakpak et al., 2016. The effect of neuro-linguistic programming on occupational stress in critical care nurses	Quantitative experimental study with experimental and control groups.	60 nurses divided into two groups	Job stress among medical workers	Three-hour NLP sessions, without a regular schedule. Total of 18 sessions over 6 months. NLP training on various topics.	Reduction in stress observed in the experimental group, not in the control group.
Thompson et al., 2002. The effect of neurolinguistic programming on organisational and individual performance	Quantitative study. Longitudinal.	67 hospitality workers	Self-esteem, self-efficacy, adaptive selling, organizational commitment, social desirability	Five NLP training sessions and two measurements after 6 weeks and 6 months of training.	Improvements noted in all dependent variables except self-efficacy.
Rao & Kulkarni, 2010. NLP for Stress Mitigation in Employees	Quantitative study. Experimental and control group study, non-randomized	36 employees divided into control and exposed to NLP treatment group	Stress, fear of being late to meetings and responsibilities	One-on-one work with employees to reduce stress levels.	NLP group exhibited less fear after intervention
Ashok & Santhakumar, 2002. NLP to promote TQM for effective implementation of ISO 9000	Quantitative study. Study with experimental and control groups, non-randomized	49 workers sorted into 3 different groups	Behavior in accordance with Kaizen methodology (continuous job improvement)	Communication training, no details on method.	NLP groups exhibited more Kaizen behaviors

After the review, a total of 4 studies were included in the final analysis, as shown in Table 2.

Characteristics of Studies Included in the Analysis

All studies included in the analysis are quantitative. Three of the studies used a quasi-experimental design, where pre-test and post-test measurements were taken on groups exposed to NLP training (Ashok & Santhakumar, 2002; Rao & Kulkarni, 2010; HemmatiMaslaktak et al., 2016). In contrast, one study employed a longitudinal design (Thompson et al., 2002), focusing solely on the group exposed to the treatment without tracking a separate control group. The sample in all four studies included employees from various industries: manufacturing workers (Ashok & Santhakumar, 2002), medical workers (HemmatiMaslaktak et al., 2016), hospitality (Thompson et al., 2002), and education workers (Rao & Kulkarni, 2010). Beyond the titles, only two studies provided more detailed information about the participants. One study included comprehensive socio-demographic data, such as gender and educational status (HemmatiMaslaktak et al., 2016). In contrast, the information provided by the other studies was limited and, in some parts, unclear (Thompson et al., 2002). The number of participants in the samples ranged from 36 to 67, and the number of participants in the groups was generally balanced. There was no information on using any method of controlling assignment to groups.

Experimental Treatment

All studies included in the analysis applied methods related to some treatment associated with NLP methodology. In three studies (Ashok & Santhakumar, 2002; HemmatiMaslaktak et al., 2016; Thompson et al., 2002), the treatment involved group education on skills and possibilities of applying certain methods, while one study applied the method of individual “one-on-one” work (Rao & Kulkarni, 2010). The duration of exposure to treatment varied across studies and included single-day training (Ashok & Santhakumar, 2002), multi-day training (Thompson et al., 2002), or training spread over several months (HemmatiMaslaktak et al., 2016). Only one study (Thompson et al., 2002) provided details about the experimental treatment curriculum, with most elements described as “usual approach,” “standard,” or “well-known method.” A common aspect of all studies is that they did not separate the effects of different training but examined the effect of treatments on various topics collectively.

Dependent Variable

The outcomes measured in the studies vary, with two studies encompassing more than one criterion (Rao & Kulkarni, 2010; Thompson et al., 2002). One study

focused on employee performance as the outcome, measuring the application of a specific methodology at work (Ashok & Santhakumar, 2002). The other studies examined various psychological variables, including stress, fear of being late to meetings, and responsibilities (Rao & Kulkarni, 2010). Additional outcomes included self-esteem, self-efficacy, sales skills, organizational commitment, social desirability (Thompson et al., 2002), and job stress (HemmatiMaslakkpak et al., 2016). One of the studies (Thompson et al., 2002) lists the psychological instruments used to measure trait levels, but aside from the scale name and its author, it did not provide further details about the scale. Only one study (HemmatiMaslakkpak et al., 2016) properly cited data on the measurement instruments used and the psychometric characteristics of the scale.

Conclusions on Treatment Effects

Positive effects of the treatments conducted were present in all four studies, with only one study stating that there was no effect in increasing one of the measured criteria (Thompson et al., 2002). In this case, it was one of several variables measured. Additionally, in one study (Thompson et al., 2002) it was reported that the effects of the applied method weakened after six months, relative to the previously demonstrated significant positive effects of the treatment.

In three studies (Ashok & Santhakumar, 2002; Thompson et al., 2002; Rao & Kulkarni, 2010), there was no clear information on how data were processed, nor were the necessary statistics for drawing conclusions presented. However, one study (HemmatiMaslakkpak et al., 2016) provided a detailed overview of its statistical data processing. The researchers applied descriptive statistics, along with inferential statistics including the Chi-square test, t-test, and Mann–Whitney test. These are standard and appropriate methods for analyzing the types of data collected in that study. Unfortunately, similar details were not provided in the other studies, making it difficult to assess the adequacy of their data processing methods.

The conclusions about the effects of the treatment were not correctly derived in any of the studies. Although the studies were quasi-experimental, the conclusions unequivocally suggested the existence of an effect of the treatments, often using terminology that implies causality. No study mentioned potential confounding variables. Three studies did not list any limitations of the research. In the study (Thompson et al., 2002) examining longitudinal effects, limitations were mentioned to justify results that indicated the weak durability of the NLP method treatment after 6 months, yet still without clear implications about what was inadequate and the serious flaws in the applied methodological approach.

Discussion

This systematic review, conducted using the PRISMA method and guidelines, aimed to assess the methodological quality of studies investigating the application of educational programs that fall under the neuro-linguistic programming (NLP) approach in a business context. This paper aimed to examine the effectiveness of NLP applications according to research conducted in an organizational setting and to determine how much these methods are based on contemporary scientific methodology.

The number of works available on this topic, especially those published in a manner that meets scientific publication criteria, is very small. While there are some studies mentioned in this paper that examine the effects of NLP on various aspects of workplace behavior and business performance, the data are insufficient to draw conclusions about any effects. Studies generally report positive effects and significant changes, but the methodological approach of these studies did not support such conclusions.

The findings of our study are consistent with a systematic review published several years ago by Kotera and colleagues (2019). Their review, which covered outcomes like self-esteem, trustworthiness, organizational commitment, and occupational stress, involved 952 articles screened; only seven articles met all inclusion criteria. The findings suggested that NLP could potentially enhance various work-related psychological outcomes, such as self-esteem and occupational stress. However, the studies generally lacked methodological rigor, leading to conclusions that the benefits of NLP were often overstated and not well-supported by robust evidence. Notably, no new studies have emerged since 2019, indicating that little progress has been made in improving the scientific rigor of research on NLP in recent years. Although the scope and criteria used by Kotera et al. (2019) were somewhat broader, this did not substantially alter the outcomes; they identified only three more studies than we did. This persistence underscores that despite the widespread expansion of the method and suggestions from NLP practitioners about the development of studies, the majority of publications on NLP are not in the domain of good scientific production or practice. This situation underscores a significant deficiency in empirical research within the field of NLP, especially in its application to organizational contexts, where there is a stark lack of rigorously validated scientific studies. Despite the focus of this work on coaching and measures of learning and development, such studies are notably absent, highlighting the gap between NLP's purported benefits and the empirical evidence available to support these claims.

The evaluation of NLP's scientific validity can be assessed using the demarcation criteria proposed by Hedrih and Hedrih (2022), based on a review of existing studies. First, NLP primarily targets the general public rather than undergoing rigorous peer review, as evidenced by the fact that none of the studies included in the analysis were published in high-impact, peer-reviewed journals.

Second, the methodologies described in these studies often lacked sufficient detail for replication, with vague descriptions of the experimental treatments and a lack of clarity on data processing in key studies (Ashok & Santhakumar, 2002; Thompson et al., 2002). Third, the treatment of errors was inadequate, as none of the studies sufficiently addressed methodological flaws or confounding variables, and most failed to list any limitations to their conclusions. This is particularly evident in the absence of critical reflections on the design and limitations of the quasi-experimental methods employed. Furthermore, there was little to no progression in NLP research over time, as indicated by the lack of improvements or advances in the reported results, and the reliance on minimal statistical reporting, limiting the development of cumulative knowledge. Finally, the studies frequently relied on anecdotal or vague evidence, with few providing detailed psychometric properties for the instruments used (Thompson et al., 2002; HemmatiMaslakpak et al., 2016), thereby undermining the empirical robustness expected in scientific research. These findings collectively highlight the pseudoscientific nature of NLP, as it consistently fails to meet the criteria for scientific rigor. However, considering the limited number of studies that met the criteria for inclusion in this analysis, it may still be premature to offer a definitive conclusion regarding the overall scientific validity of NLP. Nonetheless, this analysis underscores the urgent need for methodological improvements in future research seeking to evaluate the effects of NLP. The methodological flaws identified in existing studies, such as vague descriptions of procedures, lack of control over variables, and incomplete reporting of statistical methods, have already raised doubts about the validity of the reported results, as confirmed in this review.

Poor methodological quality jeopardizes the possibility of verification, namely the lack of replicability and thus, falsifiability. Consequently, other desirable characteristics such as simplicity, consistency, predictability, and comprehensiveness still need to be improved. Significant effort in this field will be required from researchers (as well as theorists and practitioners) in this field to overcome these deficiencies and bring NLP closer to scientifically grounded approaches. None of the included studies directly addressed the mechanisms of action necessary to more deeply understand the effect this method can have on experiential processes expected to lead to change and the positive effects that NLP promotes, even though such reports exist.

Although the analysis was detailed and extensive, the total number of four articles is insufficient to draw reliable conclusions about a pervasive methodology. As only studies published in journals meeting specific criteria were included, there may be valid and quality studies in other journals that were not considered. Additionally, only studies available in English were included, which implies that some studies may have been overlooked due to this criterion.

Conclusion

In line with conclusions from similar systematic reviews on the application of NLP methodology (Kotera et al., 2019; Pensieri, 2013; Sturt et al., 2012), additional research is needed that is more methodologically sound in order to conclude the effectiveness of NLP on the working population. This includes choosing an appropriate methodological design, sample, treatments, and a detailed description of the procedures carried out, which would primarily allow for understanding and replicability of findings by future researchers.

From all the data presented, findings on the application of NLP methodology and its effectiveness are under-researched. The results that promote this method are unfounded, not based on scientific methodology and cannot be attributed to the application of NLP. Given the widespread presence of this approach in the world and decades of use, the existence of positive effects on work efficiency cannot be dismissed, but further research is needed to confirm or refute such a hypothesis.

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Razotkrivanje preterane pomame: sistematski pregled ograničenog efekta NLP koučing metode u organizacionom kontekstu

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Apstrakt

Neurolingvističko programiranje (NLP) definiše se kao sveobuhvatan pristup komunikaciji i ličnom razvoju, sa fokusom na to kako pojedinci percipiraju svoje misli, osećanja i komunikaciju. Iako sve veći broj radova ističe primenu NLP-a u organizacionom okruženju i njegovi zagovornici usmeravaju sve više pažnje ka

istraživanjima, i dalje postoji nedostatak studija koje se bave metodološkim kvalitetom istraživanja koja donose takve zaključke. Ciljevi ovog rada bili su da se ispita efikasnost NLP metode prema rezultatima dobijenim u organizacionom kontekstu i u kojoj meri je ova metoda zasnovana na savremenoj naučnoj metodologiji. PRISMA smernice korišćene su kao metodološki pristup za analizu studija. Fokus je bio na istraživanjima koja ispituju efekte primene NLP tehnika na kriterijume vezane za ponašanje u organizacionom kontekstu. Pretraga istraživačkih baza podataka rezultirala je finalnom selekcijom samo četiri članka iz početnog uzorka od 720. Nalazi sugerišu da NLP može biti efikasan za razvijanje širokog spektra psiholoških ishoda povezanih sa organizacionim ponašanjem, ali gotovo svi nalazi su upitni zbog loše metodologije korišćene u istraživanjima, nejasnog izveštavanja i malog broja studija koje su ispitivale ove fenomene. U radu se razmatraju različiti nedostaci u kontekstu kriterijuma naučne teorije i dizajna istraživanja, sa preporukama za dalja istraživanja, kako bi se istražila istinitost/efikasnost promovisanih metoda.

Ključne reči: NLP, istraživanje, metodologija, organizaciona efikasnost, koučing

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Feedback Informed Supervision of Psychotherapeutic Process Monitored by Synergetic-Navigation System (Case Study)*¹

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Abstract

The effectiveness of psychotherapeutic treatment represents an important topic in modern psychotherapeutic science. Client factors, in fact, play the most significant role in predicting potential positive changes, while other factors are common to all modalities. To understand the psychodynamics and critical unstable periods of an individual, the practice has adopted the method of the synergetic-navigation system and informed treatment which involves the supervisor, the psychotherapist, and the client. This article presents a case study of applying the synergetic-navigation system and informed treatment in the supervision process: it explains the daily monitoring of the client and the feedback given to the psychotherapist and supervisor, which was based on the analysis of the client's daily entries. The results are shown in diagrams of complex resonations and repetition graphs of time series. The article demonstrates the potential for understanding the complex psychodynamics of the client, for planning and conducting treatment based on the data obtained from the synergetic-navigation system, and for potentially predicting future critical unstable periods of the client, including possible problematic behaviors. The application of the aforementioned client monitoring and feedback can also be extended to other disciplines.

Keywords: process and outcome of psychotherapy, supervision process, synergetic-navigation system, SNS, feedback-informed treatment.

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Feedback Informed Supervision of Psychotherapeutic Process Monitored by Synergetic-Navigation System (Case Study)

Introduction

For psychotherapy to effectively address the challenges of those participating in it, a deep exploration of the human psyche and a thorough understanding of the complex origins behind current experiences and behaviors are necessary to facilitate therapeutic change (Duncan, 2014). Duncan (2014) states that we also need an understanding of how change occurs in therapy. In this work, we initially present numerous reasons for the development of mental disorders, especially the psychodynamics of clients with challenging behaviors. In the subsequent empirical part, within the context of contemporary psychotherapeutic science, we present the application of the method of the synergetic-navigation system (hereinafter the SNS method) (Schiepek et al., 2015), which enables daily tracking of the client's complex psychodynamics. By incorporating feedback to the therapist, the analysis of data obtained with the SNS method creates opportunities for planning therapeutic strategies that lead to more effective treatment or change on the client's side. This form of client treatment can also serve as a demonstration for its use in other disciplines (such as psychology, sociology, medicine, etc.).

The Complex Aetiology of Mental Disorders

There are several risk factors for the occurrence or development of mental disorders, including genetic factors (Kendler & Prescott, 2006), personal characteristics (Caspi et al., 1996), chronic stress (McEwen, 2004), biochemical factors in the brain (Nestler & Hyman, 2010), substance use (Kessler et al., 1997), brain injuries (Perry et al., 2016), chronic illnesses (Verhaak et al., 2005), and trauma experiences (Rothschild, 2000, 2017; Van der Kolk, 2014). The latter can lead to acute or post-traumatic stress disorder but whether this happens depends on numerous factors related to the individual's psychosocial context before, during, and after the traumatic event (Sayedet et al., 2015).

In the following section, we will highlight the risk factors associated with the development of mental disorders from the psychoanalytic perspective. Psychoanalysis focuses particularly on early relationships within which specific brain structures are formed, shaping the individual's personality, as well as their emotional, cognitive, and social development, and providing a foundation for mental stability (Siegel & Bryson, 2012). Initially, psychoanalysis believed that seeking to appease internal drives or motivators in the pursuit of inner shapes a person. As developmental processes progressed, interest emerged in object relations as a secondary motivator that shapes the individual. As a result, mental disorders were grounded in very early development. Modern psychoanalytic developmental theory has thus evolved from

the object relations tradition, where psychological development is seen as emerging in the matrix of interpersonal relationships. Understanding specific mental disorders that drive psychoanalytic practice today is based on the understanding that an individual's mental life is determined by dyadic structures which are internalised from birth onwards (Malberg & Mayes, 2015).

The past decades have provided ample evidence that supports the proposition that the development of mental disorders is linked to a history of abusive or neglectful environments (Malberg & Mayes, 2015). For an individual to functionally respond to developmental and social challenges, they need what is called a self-regulatory system within them; early relationships are extremely important for its development. The role of these relationships is formative, as they encourage the development of key brain self-regulatory mechanisms that enable an individual to effectively function in society (Fonagy & Target, 1996). From the point of view of attachment theory (Bowlby, 1969, 1973, 1980) one of the risk factors for the development of many disorders is attachment problems and sensitivity to the child's expressed emotions (Bradley, 2000; Poljanec & Kompan Erzar, 2016).

To help a client, he must first be seen as a complex psychodynamic system and understood within the context of the role and scope of the therapist-client relationship. As Duncan et al. (2000) say, the individual who plays the most heroic role in psychotherapeutic treatment is indeed the client.

Most clients who engage in psychotherapy make progress. Three out of four reduce dysfunctional symptoms and improve positive functioning. On average, 80% of those who have undergone psychotherapeutic treatment fare better compared to a sample of people who have not received psychotherapy (Smith & Glass, 1977; Wampold & Imel, 2015).

The Client as a Complex Psychodynamic System

From Možina (2021) perspective it is essential to consider the client from two different perspectives when seeking to understand them. The first involves a so-called nomothetic view, where there is a generalized understanding of a person as a being who combines universal biological, physical, psychological, sociological, philosophical, and informational characteristics within themselves. The second perspective looks at the individual idiographically, where the person is understood as specific, with a unique complex psychodynamic system that encompasses a unique pattern or intertwining of the client's cognitive, emotional, and behavioral personality characteristics. These constantly changing and interacting elements can be summarized in one word: synergy (Možina, 2021).

Synergy, as part of the science of complexity, is a transdisciplinary metatheory. Its central concept is self-organization, with the key question being how patterns are formed (how order arises from disorder or chaos) and how transitions between patterns occur (Možina, 2021). In the field of psychology, for example, it examines learning, personality development, changes in emotions, thinking, behavior, and

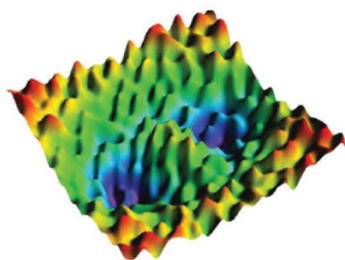
relationships, as well as mental processes in the broadest sense (Bateson, 2019, as cited in Možina, 2021). From the perspective of self-organization, synergy defines psychotherapy as destabilizing dysfunctional patterns and generating new patterns of behavior, emotions, thinking, and relationships within a stable, trusting, and secure relationship between the therapist and the patient (Haken & Schiepek, 2006, as cited in Možina, 2021). Schiepek, together with the founder of synergy, Hermann Haken, did pioneering work when he transferred the concept from the fields of physics, chemistry, and biology to psychology and psychotherapy (Haken & Schiepek, 2006, as cited in Možina, 2021). Since synergy, theories of nonlinear systems, and chaos theory enable mathematical formalization and simulation of bodily, psychological, and social self-organizing processes in complex systems, this widely opens the doors to psychotherapy treatment exploration (Možina, 2021).

Schiepek (2006) describes the personality of the client using synergetic models, namely using the metaphor of a landscape with different potentials. In the *potential landscape* metaphor these are the valleys in a landscape representing our personality. When the valleys are not too deep and the mountains between them not too high, we can switch between cognition-emotion-behavior patterns as appropriate (Schiepek et al., 2015).

Changes in an individual's personality arise from new experiences, which can be seen as alterations in the diversity of this landscape. The colored continuum illustrates the client's stable periods (represented by green) compared to unstable periods (represented by red). We can imagine a healthy individual's personality as a diverse landscape (with not much difference between the potentials in the landscape), characterized by aspects of stability and flexibility. Multi-stability of evolving potential landscapes is an essential feature of healthy and adaptive functioning in complex systems (Deco et al., 2013).

Image 1

Illustration of the complexity of an individual's personality through the metaphor of a landscape with potentials (Jansen, 2014)



One of the contemporary discoveries of psychotherapeutic science is that the client contributes the most to the successful outcome of treatment (Duncan et al., 2000). Factors on the client's side decisively influence the change in the psychodynamic picture. Orlinsky et al. (2004) identify the quality of the client's participation as the most important determinant for the successful outcome of psychotherapeutic treatment.

The authors further delineate the following variables on the client's side in detail: the client's ability to participate in treatment, the experience of the relationship with the therapist, the client's contribution to the quality of the therapeutic relationship, the adequacy and suitability of the therapeutic approach for the client, the client's ability to express emotions, the client's openness to the therapist's work, the emotional and verbal openness of the client, and the connectedness and acceptance of treatment by the client. Grawe (2004) also emphasizes the importance of the client's intrinsic motivation, which decisively contributes to treatment outcomes. Asay and Lambert (1999) explain that 40% of the variance in outcome depends on client factors and their social environment to which they are directly exposed. Wampold (2001) states in his research that only 14% of the outcome of psychotherapy is attributed to factors related to therapy (therapist, psychotherapeutic modality, therapeutic techniques, the relationship between the client and the therapist, placebo effect, and therapist's loyalty or commitment to the modality).

Despite the significant portion of variance in favor of factors on the client's side, the therapist is also a central factor in the successful psychotherapeutic outcome for the client. The therapist's most important variables include: their personality, their ability to empathize, their level of experience, social and other competencies, authenticity, and genuineness in reactions. The psychotherapeutic school from which the therapist originates is the least important variable. The effect of these variables ranges between 0.50 and 0.60 (Wampold, 2001). Lastly, but significantly cited in the psychotherapeutic scientific literature, the therapeutic alliance is believed to represent an effect size of 0.45 on the outcome of psychotherapy (Duncan et al., 2000; Možina, 2021; Wampold, 2001).

The relationship between the therapist and the client is also mutual, and it is not just the therapist who teaches the client. The relationship works in both directions, and the client also teaches the therapist, guiding them unconsciously to achieve the corrective experience they seek. The therapist must recognize this, respond professionally, and see it as an opportunity. Both lead and influence each other's dynamics (Haken & Schiepek, 2010). Scientific guidelines for achieving effective psychotherapeutic treatment do not lie in the use of specific instructions or standardized therapy procedures (based on modality), but in the use of programs that implement systematic monitoring of the client's process, such as the SNS method (Schiepek & Aichhorn, 2013).

The psychotherapeutic process is thus a complex system where variables are nonlinearly interconnected, meaning that small differences in factors can have significant consequences as they can simultaneously contribute to changes in all other factors (Clarkin & Levy, 2004; Schiepek & Cremers, 2003).

Daily Monitoring of the Client and Feedback-informed Treatment

The SNS is a generic system that makes it possible to implement various questionnaires as well as rating and observation systems; it is available for the international market and all kinds of questionnaires can be introduced. Data can

be entered using most web-compatible devices. Data privacy protection and data security are guaranteed. It enables outpatient monitoring and assessment of clients in various disciplines (psychotherapy, psychosomatics, medicine, psychiatry, counseling, etc.). It allows the collection of individual daily client data (real-time monitoring) (Schiepek & Aichhorn, 2013). Continuous, regular, and temporally consistent measurement is required to identify patterns in the client (including psychodynamic patterns). Within the SNS program, pre-prepared standardized questionnaires can be utilized, or an individualized personal questionnaire can be developed collaboratively with the client (idiographic system modeling) (Schiepek et al., 2015).

Schiepek et al. (2015) also report on the creation of a stronger therapeutic relationship that develops due to the use of the SNS program and the feedback of client data in psychotherapeutic sessions; the therapist and client review data from previous days together and provide feedback based on graphs, which are linked to qualitative descriptions of the client's experiences from previous days. Clients describe the daily use of the SNS system as a "small personal therapy," a ritual for calming, quality time with oneself, and reflection on the day. Not only does the SNS program have diagnostic value (for psychotherapist and supervisor), but it also has therapeutic value. In addition to the effects mentioned earlier, the data can also be utilized for feedback-informed treatment and tracking changes in client patterns (also during supervisions).

Lambert (2010), based on using feedback information in the psychotherapeutic process, identified improvements on the client side. The author presented evidence from clinical trials that support the systematic collection and use of real-time outcome data. Results from several studies have shown that providing feedback to therapists on clients' progress improves outcomes for clients who were predicted to be at risk of deterioration. Providing additional feedback to therapists - including client ratings of therapeutic alliance, readiness to change and the strength of existing non-therapeutic supports - increases impact and doubles the number of clients who experience a clinically meaningful outcome. Miller et al. (2006) found that successful outcomes of psychotherapy increased from 34% of cases to 47% after using feedback-informed treatment based on daily client tracking, and reduced unsuccessful outcomes from 19 to 8%. Similar findings have been reported by other researchers, including for other forms of psychotherapy, such as couples therapy, family therapy, etc. (Anker et al., 2009).

Feedback-informed daily data collection of the client also does not dictate specific techniques (oriented towards modality) and prescribed instructions that the therapist must use, but rather adapting the treatment to the client and implementing a feedback-driven dynamic approach (Schiepek et al., 2015).

The main aim of our study was the application and evaluation of the synergetic-navigational system method in supervision processes, originating from the theory of synergetics (Haken & Schiepek, 2010), which allows the therapist and supervisor to monitor the client "here and now" or in the moment (real-time monitoring) (Schiepek & Aichhorn, 2013), and to recognize the dynamics of their cognitive,

emotional, and behavioral patterns. For the need of this study, the psychotherapist and supervisor regularly provided feedback during supervision on observed patterns on the client's side. Identifying client patterns enabled the psychotherapist to adjust psychotherapeutic treatment promptly, appropriately, and effectively.

The article presents results and findings that address the main research question: How can the use of the SNS method in supervision help identify and address the cognitive, emotional, and behavioral patterns of the client and inform the planning of further psychotherapy treatment?

Method

Sample and Procedure

Based on voluntary sampling, the sample included a client (age: 38 years old, education: master degree), a psychotherapist of psychoanalytic psychotherapy, and a supervisor of psychoanalytic psychotherapy.

The inclusion criteria for the study were: good prognosis for a longer psychotherapeutic process, client's motivation for personal change, and for an in-depth psychotherapeutic process. The exclusion criteria were severe symptomatic distress: client screening assessment based on the GSI factor to assess severe symptom distress with the SCL-90 questionnaire (Derogatis, 1994) and a history of psychiatric hospitalizations.

At the time of inclusion in the study, the client had already completed 75 psychotherapeutic sessions in an individual setting (once or twice a week). His reasons for seeking psychotherapeutic treatment were separation, impulsive reactions, self-regulation difficulties, and alcoholism.

Measures

Data collection took place from April 5, 2023, to August 22, 2023 (N=149 days), using a mixed methodology approach. In the study, a computer program called the synergetic-navigation system (abbreviated as SNS method) was used, (a) along with an integrated questionnaire; (b) qualitative unstructured exploratory interview conducted during supervisions; (c) and qualitative notes by supervisor.

(a) **Revised daily questionnaire of the therapeutic process (TPV-R; Kovačević Tojnko & Rožič, 2022)**, integrated into the SNS application and computer program (Schiepek et al., 2015), enabling daily monitoring relevant patterns of the client through application of the selected questionnaire. The Slovenian version of the original Therapy process questionnaire (Schiepek et al., 2012) was adapted for the research needs (excluded items connected to treatment in clinical setting and double back translated), and it includes 5 factors and a total of 33 items.

Table 1

Part of original daily questionnaire Therapy process questionnaire (TPV-R) used in research (Kovačević Tojnko & Rožič, 2022)

1. FACTOR: Well-being and positive emotions (WPE/DPČ)			
1	Today I felt comfortable in my body	not at all	very comfortable
2	Today I felt joy	not at all	very much
3	Today I experienced moments of happiness and light-heartedness	not at all	very much
4	Today my self-esteem was	very low	very high
5	Today I felt energized	not at all	very much
6	Today I was satisfied with myself	not at all	very much
7	Today I felt valued	not at all	very much
2. FACTOR: Emotional and problem intensity (EPB/ČPO)			
8	Today I felt guilty	not at all	very much
9	Today I felt sad	not at all	very much
10	Today I felt angry	not at all	very much
11	Today I felt anxious	not at all	very much
12	Today I felt shame	not at all	very much
13	Today I felt tense and restless	not at all	very much
14	Today my problems/complaints were ...	absent	very intense
15	Today I felt helpless with regard to my problems	not at all	very much
16	Today I felt impaired by my complaints in my daily routine	not at all	very much
3. FACTOR: Insight/confidence/therapeutic progress (VZF/RZN)			
17	Today I came closer to a solution for my problems	not at all	very much
18	Today I felt able to deal with situations that I never felt able to deal with before	not at all	very much
19	Today I had new insights about how to better deal with my life circumstances	not at all	very much
20	Today I felt confident that I will resolve my issues	not at all	very much
21	Today I gained insight into how my thoughts, feelings and behavior influence each other	not at all	very much
22	I now understand myself and my problems better	not at all	very much
23	Today I became aware of relations that were not clear to me before	not at all	very much
24	Today I felt confident to approach burdensome issues in my life	not at all	very much
4. FACTOR: Motivation for change (MOT/MOT)			
25	Today I felt motivated to work on accomplishing my goals	not at all	very much
26	Today I felt determined to tackle my problems	not at all	very much
27	Today I was committed to accomplish my goals	not at all	very much
28	Today I had my goals clearly in mind	not at all	very much
29	Today my interest in the topics of therapy was	very low	very high
5. FACTOR: Mindfulness/self care (AKB/ČOP)			
30	Today I treated myself with care	not at all	very much
31	Today I paid attention to my boundaries/limits	not at all	very much
32	Today I paid attention to my bodily signals	not at all	very much
33	Today I was aware of my own needs	not at all	very much

(b) Three rounds of qualitative unstructured exploratory interviews with the psychotherapist (exploratory case study) (Streb, 2009) were conducted during supervision, utilizing client data gathered through the SNS method. The focus was on data from graphs of individual factors, paying specific attention to identifying the client's cognitive and emotional states that may contribute to challenging (or risky) client behavior. The interviews were recorded in audio format.

(c) Qualitative notes from the supervisor following the conducted unstructured exploratory interviews (after supervision sessions) are intended to provide an overall feedback report from the supervisor and to identify any possible missing insights into psychotherapy treatment.

Data Analysis

The SNS method (Schiepek, 2009), in addition to daily data collection, enables their analysis (measuring the process and outcome of psychotherapy) through the use of nonlinear statistical methods (time series analysis), based on which the program automatically generates a diagram of complex resonating (the diagram depicts significant changes in complexity between individual items and factors) and a repetition graph of time series (showing significantly identified recurring patterns of time series in X time (Orsucciet al., 2005; Schiepek et al., 2015). High validity and reliability of the SNS method are ensured (Schiepek et al., 2014).

The client's data, collected through the SNS method, was explored during the supervision process via unstructured exploratory interviews conducted by the psychotherapist and supervisor. This approach aimed to gain in-depth insights into the client's periods of (in)stability in everyday life. Additionally, the supervisor took notes after the supervision sessions to report important observations made during both the supervision and the exploratory interviews. The data from the interviews and notes provided a qualitative understanding of the client's information from SNS.

Results

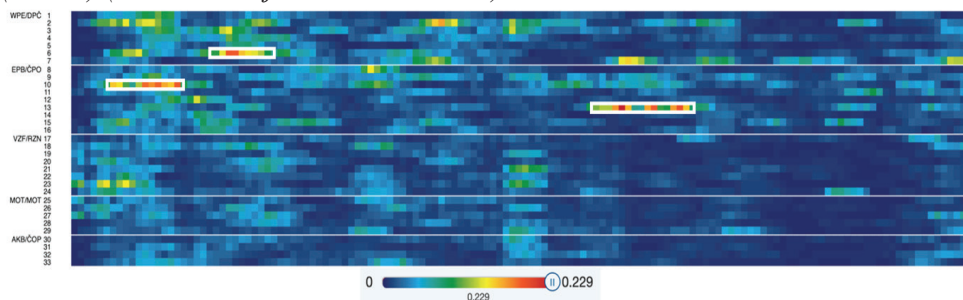
Next come the results of the application of the SNS method on a client's case and feedback application of the obtained client results within the exploratory interview. The computer program SNS offers various methods and forms for displaying statistical data processing. Below, we present the two most common representations of the results of daily monitoring of the client's psychodynamics (Complexity Resonance Diagram and Recurrence Plot Time Series Data Diagram).

In Graph 1, the Complexity Resonance Diagram for the client's daily TPV-R questionnaire is displayed. The data collection period lasted 149 days (or 149 measuring points), with items grouped horizontally into five factors; each square represents an individual value of dynamic complexity. The color scale ranks the values of dynamic complexity from a minimum value of 0.0 (dark blue color) to a

maximum value of 0.229 (dark red color). The contrast between colors facilitates easier visual recognition of low and high complexity. Referring to the marked areas on the Graph 1, horizontal patterns reveal destabilizations in the following items: “Today I was satisfied with myself.” (item 6), “Today I felt angry and upset.” (item 10), “Today I felt inner unrest or tension.” (item 13).

Graph 1

Complexity Resonance Diagram for the client's Therapy process questionnaire (TPV-R) (KovačevićTojnko & Rožič, 2022)



From Graph 2, critical unstable periods of the client in the psychotherapy process and changes in psychodynamic patterns are apparent. The scale from white to black represents a ranking from the absence of changes in repetitive dynamics (white color) to the perception of more frequent changes in repetitive dynamics, indicating significant changes in dynamics (light grey, medium grey, and black color). Three vertical patterns denote increased dynamic complexity across multiple items simultaneously, indicating periods of critical instability for the client. Two longer and one shorter emotionally unstable periods of the client are evident; these could be risky periods for the client in terms of inadequate control of their emotional state through inappropriate behavior (the possibility of slipping or relapsing into drinking behavior despite established abstinence).

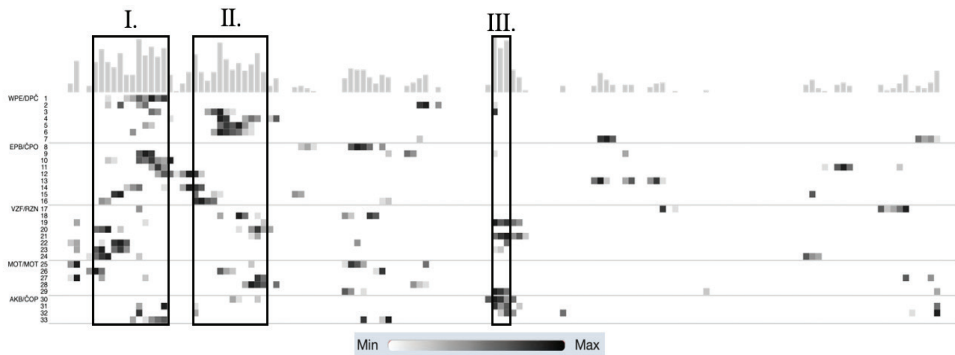
In the first two periods (I. and II.), pronounced unstable fluctuations were perceived in the following items of the factors Well-being and positive emotions (WPE/DPČ) and Emotional distress and problems (EPB/ČPO): “Today I felt pleasant in my body.” (item 1), “Today I was full of energy.” (item 5), “Today I was satisfied with myself.” (item 6), “Today I felt sad.” (item 9), “Today I felt angry and upset.” (item 10), “Today I felt anxious.” (item 11), “Today I was ashamed.” (item 12), “Today I felt powerless regarding my problems.” (item 15), “My problems hindered me in everyday functioning.” (item 16).

In the exploratory interview between the supervisor and psychotherapist, the data provided a more detailed understanding of the client's experiences during period I (as shown in Graph 2), within which item No. 10 was notably unstable (illustrated in Graph 1). During this critical period of instability in the psychotherapeutic process, the client was dealing with the theme of establishing abstinence from alcohol and reported difficulties in doing so, particularly internal conflict and intense feelings

of anger. There was also resistance to psychotherapeutic treatment, manifested as unstable trust in therapeutic progress. In the unstable period II, there was a pronounced unstable experience of well-being and positive emotions. The interview further revealed that the client reported struggles with self-esteem, a decrease in energy for work and other areas of life, general dissatisfaction with life, decreased motivation to achieve goals, undergo treatment, or change, and resistance to treatment. Following a longer stable period, the supervisor and psychotherapist reported that the client's improvement in symptoms indicated changes achieved by the client (relocation, debt repayment, career advancement, new relationship).

Graph 2

Recurrence Plot Time Series Data Diagram for the client's daily TPV-R questionnaire, where the continuum from white to black represents a continuum from the absence of changes to more frequent presence of changes in dynamics.



During the final, shorter unstable period (III.), instability was no longer observed in the previous items but in items related to the factor UTS/BTR - Understanding/Trust/Therapeutic Progress: “Today, I gained new ideas on how to better cope with my life circumstances.” (item 19), “Today, I realized the mutual influence of my thoughts, feelings, and actions.” (item 21), and items related to the factor AWC/MND - Mindfulness: “Today, I handled myself carefully.” (item 30) and “Today, I seriously considered my needs.” (item 31). In this unstable period, the client actively engaged in establishing self-regulating mechanisms, behavior change, self-attitude adjustments, and self-care in the therapeutic process.

Graph 1 (item 13) later showed prolonged instability in inner peace and tension. The supervisor and psychotherapist assessed that during this period, it was still necessary to support the client in maintaining abstinence (with potential risks of relapse in additional triggers), establishing, and maintaining self-regulation, and continuing and reinforcing the therapeutic changes achieved. It was noted that the client had managed to establish stable conditions beneficial for the forthcoming extended psychotherapeutic treatment, aimed at setting up self-regulating structures for the client.

Discussion

The primary factor for predicting successful processes and outcomes in psychotherapy remains predominantly the client (87%), and therefore, it is crucial that researchers have developed tools for a profound understanding of their psychodynamics (including their challenging behaviors) (Schiepek et al., 2015). In contemporary psychotherapeutic science, it is essential to acknowledge that without regular monitoring of clients' experiences and responding promptly to their needs, we cannot speak of effective treatment.

In practice, the SNS method of monitoring clients was developed to record changes in patterns and stable or unstable periods daily, between psychotherapeutic sessions which can be evaluated during supervisions. This enables timely intervention (appropriate timing, responding to the client's state, "here and now," and not delayed "retrospectively") and focused interventions (based on observing the client's stable and unstable periods, targeting specific unstable areas to develop targeted interventions and treatment methods). Moreover, it gives us the opportunity to achieve effective treatment outcomes by focusing specifically on the client's life and the kind of stability they experience in everyday life (focusing on the client's factors).

The study demonstrates the application of the SNS method in the psychotherapeutic process and how the data collected provides feedback about the client during supervision, with insights gained by the supervisor and therapist through data analysis. This helped the psychotherapist and supervisor to timely recognize emotional, cognitive, and behavioral patterns in clients, allowing them to make timely interventions at appropriate times, address areas where the client felt unstable, and establish stable patterns effectively.

Later during the therapeutic process, destabilization only occurred in localized items and not globally, indicating a gradual stabilization but still showing the client's susceptibility to re-destabilization in the event of stressors. Based on this, the supervisor and therapist anticipated potential unstable cognitive, emotional, and behavioral states and planned future treatment accordingly.

The limitations of the study are that feedback-informed treatment was conducted only in the supervisory process, and we had qualitative data from the therapist, who attempted to understand the data obtained from the SNS method based on insights from the client's narrative. In the future, we will design the study so that the therapist also implements feedback-informed treatment and records the client's explanations of the data through journal entries or audio recordings.

Conclusion

In this case study, daily monitoring of the client was conducted during the supervision process while providing feedback based on the data obtained. Systematic daily monitoring with the scientific tool of the SNS method, combined with feedback (from the supervisor and therapist), provides vast opportunities for a profound and holistic insight into the psychodynamics of clients' cognitive, emotional, and behavioral patterns.

Based on all these results, continuous completion of questionnaires over an extended period allows for predicting the client's future states (the SNS method enables forecasting a few days ahead), facilitating effective treatment planning or interventions to prevent predicted deterioration in the client's condition, as anticipated by the SNS program.

By using the client's data from his everyday life (one of the significant common factors in psychotherapeutic modalities), the therapist gains essential information for understanding, planning, and predicting changes in the client. The presented treatment method can also be applied within other disciplines (in psychology, psychiatry, somatic medicine, social work, sociology, etc.) as through the daily monitoring of patients (questionnaires can be adapted according to monitoring needs), it aids in a more profound understanding of the complex individual system, treatment planning, and predicting future unstable periods.

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Supervizija psihoterapeutskog procesa na osnovu povratnih informacija koje prati sinergetske-navigacioni sistem (studija slučaja)

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Apstrakt

Efikasnost psihoterapijskog tretmana predstavlja važnu temu u savremenoj psihoterapijskoj nauci. Faktori koji se odnose na klijenta, zapravo, igraju najznačajniju ulogu u predviđanju potencijalnih pozitivnih promena, dok su ostali faktori zajednički za sve modalitete. Za razumevanje psihodinamike i kritičnih nestabilnih perioda pojedinca, praksa je usvojila metod sinergetske-navigacionog sistema i informisanog tretmana koji uključuje supervizora, psihoterapeuta i klijenta. Ovaj članak predstavlja studiju slučaja primene sinergetske-navigacionog sistema i informisanog tretmana u procesu supervizije: objašnjava svakodnevno praćenje klijenta i povratnih informacija datih psihoterapeutu i supervizoru, koje su zasnovane na analizi dnevnih unosa klijenta. Rezultati su prikazani u dijagramima složenih rezonacija i grafovima ponavljanja vremenskih serija. U članku je prikazan potencijal za razumevanje kompleksne psihodinamike klijenta, za planiranje i sprovođenje tretmana na osnovu podataka dobijenih iz sinergetske-navigacionog sistema, kao i za potencijalno predviđanje budućih kritičnih nestabilnih perioda klijenta, uključujući i moguća problematična ponašanja. Primena prethodno pomenutog praćenja klijenata i povratnih informacija može se proširiti i na druge discipline.

Ključne reči: proces i ishod psihoterapije, proces supervizije, sinergetske-navigacioni sistem, SNS, tretman zasnovan na povratnim informacijama.

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