
PERSONALITY TRAITS, PREOPERATIONAL THINKING, AND MENTAL HEALTH

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Abstract

It has been suggested by various cognitive behaviour theorists that the perceptual and cognitive characteristics of the preoperational cognitive stage, defined by Piaget as the second stage of cognitive development, manifest themselves in chronic depression and various personality disorders. Although individuals have a formal level of functioning in their work life, they may experience regression to the preoperational domain due to an event in the interpersonal domain. In this study, the relationships between preoperational thinking and psychiatric symptoms (depression and anxiety) and personality traits were analysed. The sample consisted of 61 patients and 102 healthy individuals (104 women, 55 men). Sociodemographic form, Personality Belief Questionnaire-Short Form (PBQ-SF), The Luebeck Preoperational Thinking Recording Scale (LQPT) and Patient Health Questionnaire -9 (PHQ-9) were applied to the participants.

The study results revealed a diverse predictive role of LQPT scores across different personality traits. LQPT is highly predictive for traits like Histrionic and Dependent, moderately predictive for Borderline, Obsessive-Compulsive, and Antisocial, less predictive for Paranoid, Passive-Aggressive, and Narcissistic, and not predictive for schizoid personality traits. The results of this study also showed a significant relationship between an increase in general psychiatric symptoms (depression and anxiety) and an increase in preoperational thinking levels. It was also found that preoperational thinking was significantly higher in patients with psychiatric disorders (GAD, OCD, depression, panic disorder). These findings support the results of previous research that provide a new interpretation of Piaget's work on the preoperational stage in the context of personality and psychiatric symptoms in adults.

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Individuals with personality disorders hold negative schemas - beliefs about themselves, other people, and the world - strongly. These beliefs may affect the person's thoughts, feelings, and behaviors (Albein-Urios et al., 2019; Otani et al., 2018; Sargin et al.,). It has been suggested that individuals with personality disorders' thinking styles and beliefs show the characteristics of the preoperational stage of cognitive development (Leahy, 1995). It is stated that early negative personal schemas are formed at the preoperational level and are, therefore, determined by the rigid structure of preoperational thinking (Leahy, 1995; Sperry & Sperry, 2016).

Piaget, one of the leading figures in the field of cognitive development, states that the best way to understand the nature of the adult mind is to examine the development of an individual's mental activity from birth and observe the changes that the individual undergoes in the process of adapting to the environment (Piaget, 1950). The preoperational stage, the second of the developmental stages in the cognitive development theory developed by Piaget, covers the stage between the ages of 2 and 6-7 (Wadsworth, 2015). Children exhibit a deficit in abstract reasoning and perceive situations limited to their perspectives at this developmental stage. Key characteristics of this stage include a lack of reasoning, reliance on intuition, a tendency to focus on one aspect of an event, and an underdeveloped perception of multifaceted concepts such as cause and effect. In addition, children may show impulsive actions, a monotonous way of speaking, and a pronounced egocentrism, indicating a poor understanding of others' points of view (Piaget & Inhelder, 2013; Wood et al., 2001).

The first theory to draw scientific attention to the relationship between preoperational thinking style and psychopathology is the Cognitive Behavioral Analysis System of Psychotherapy (CBASP) developed by McCullough (2003). CBASP, explicitly developed for the treatment of chronic depression, suggests that individuals with chronic depression have a thought structure fixed in Piaget's preoperational stages of cognitive development (McCullough, 2003). Biological, cultural, and personal experiences have an impact on cognitive development. Some individuals may show early-stage characteristics in the social cognitive domain as a result of the interaction of environmental stimuli (e.g., living environment, traumatic situations) and individual characteristics (e.g., intelligence level, emotional characteristics) (McCullough, 2003). CBASP suggests that challenging environmental conditions experienced during early development disrupt or delay normal emotional-cognitive development in individuals. This is based on the similarities between the thought structures of chronically depressed individuals and preoperational children (McCullough, 2003).

In the formation of personality disorders, schemas from the preoperational stage persist into adulthood with avoidance and compensation (Leahy, 1995).

Individuals with personality disorders are characterized by deficiencies in some or many skills learned during development and a thinking pattern resembling the early developmental stage (Sperry & Sperry, 2016).

Researchers have suggested that characteristics typically associated with the preoperational cognitive stage are frequently observed in individuals diagnosed with personality disorders (Leahy, 1995; Driscoll et al., 2004). For example, these individuals think concretely in the interpersonal domain and struggle to understand abstract concepts. They cannot understand the perspectives of others from their point of view (Gan et al., 2020; Sargin et al., 2017); they have difficulty in expressing or managing their emotions correctly; they may have irrational or irrational thoughts; they have the binary (i.e., all or nothing) thinking style of preoperational thinking (Driscoll et al., 2004; Fonagy & Bateman, 2016). They emphasize outcomes rather than intentions. Like the egocentrism of the preoperational stage, they tend to personalize adverse events perceive, and interpret events through themselves. They have difficulties in interpersonal relationships and social areas. They have intense cognitive distortions. They focus on only one side of events, as in cognitive distortions such as generalization, mind reading, labeling, and all-or-nothing thinking. They have the universal thinking of the preoperational stages, such as the repetition of negative experiences in the past or that they will have a similar future (Driscoll et al., 2004).

The relationship between preoperational thinking and personality disorder is not fully understood. However, some experts believe that the two conditions may have common origins. For example, parents of people with personality disorders may have difficulty forming healthy relationships with their children. This can affect their emotional development and lead to the development of preoperational thinking. Some experts believe that individuals may revert to preoperational thinking because the preoperational structure of the schema acts as a structural fixation, and they have difficulty understanding and coping with the world around them (Leahy, 1995; Mccullough, 2003). These individuals may continue their lives generally until they experience a regression to the preoperational stage in their adult lives (Leahy, 1995). While they may have a formal level of functioning in their occupational life, they may experience a regression to the preoperational domain due to an event in the interpersonal domain (Mccullough, 2003). For example, a person with a personality disorder may have a traumatic experience. This experience may cause the person to perceive the world as unsafe and unpredictable. This may cause the person to focus on concrete thinking and their point of view.

More research is needed into the relationship between preoperational thinking and personality disorders. This study aims to investigate the relationship between preoperational period and personality traits and psychiatric symptoms. It is thought that this research may help us to understand better why these two conditions are related and how they can be used to treat personality disorders.

Method

Participants

The patients who participated in the study consisted of individuals with diagnoses such as depression, obsessive-compulsive disorder (OCD), generalized anxiety disorder (GAD), panic disorder, etc. who applied to an private outpatient center for psychotherapy which is second author is director, while the healthy participants consisted of adults living in Ankara and who did not receive any diagnosis according to DSM-5. This study involved a comparative analysis between patients ($n=61$) and healthy groups ($n=102$). The patient group comprised 61 individuals with a mean age of 34.18 years ($SD = 11.56$). The mean educational background of the group was 15.07 years ($SD = 2.39$). Regarding sex distribution, 37 participants were female (60.66%) and 24 were male (39.34%). The healthy group comprised 102 individuals with a mean age of 35.84 years ($SD = 9.46$) and a mean education of 14.71 years ($SD = 2.71$). The sex distribution was 71 females (69.61%) and 31 males (30.39%). Independent sample t-test was used to compare age, total years of education, and income; the Pearson Chi-Square test was used to analyze gender and marital status differences between groups. No significant difference was found between the groups except for marital status ($p = .033$). The study was conducted by the ethical standards of the responsible committee and the Declaration of Helsinki. All participants gave informed consent before inclusion in the study. The detailed sociodemographic characteristics of the patients and the healthy groups are presented in Table 1.

Table 1. Sociodemographic characteristics of the patients and the healthy group

Variable	Group		<i>p</i>
	Patients ($n=61$)	Healthy group ($n =102$)	
	<i>M (SD)</i>	<i>M (SD)</i>	
Age	34.18 (11.56)	35.84 (9.46)	.346 ^b
Total years of education	15.07 (2.39)	14.71 (2.71)	.393 ^b
Income ^a	30.2K (8.7K)	30.7K (20.1K)	.837 ^b
	<i>n (%)</i>	<i>n (%)</i>	
Sex			.242 ^c
Female	37 (60.66%)	71 (69.61%)	
Male	24 (39.34%)	31 (30.39%)	
Marital Status			.033 ^c
Single	30 (49.18%)	33 (32.35%)	
Married	31 (50.82%)	69 (67.65%)	

Variable	Group		p
	Patients (n=61)	Healthy group (n =102)	
Diagnosis			-
Depression	16 (26.2)	-	
OCD	10 (16.4)	-	
GAD	6 (9.8)	-	
Panic Disorder	5 (8.2)	-	
Other	24 (39.4)	-	

a: Turkish lira; b: independent samples *t*-test; c: Pearson Chi-Square

Instruments

Personality Belief Questionnaire-Short Form (PBQ-SF). The PBQ-SF developed by (Butler et al., 2007), derived from the long-form PBQ, assesses key personality pathologies across nine dimensions. It features seven items per dimension, rated on a 0-4 scale. The overall Cronbach's Alpha for the PBQ-SF has been reported as .97, with dimension coefficients ranging from .81 to .92, and test-retest reliability between .57 and .82. The Turkish adaptation by Taymur et al. (2011) consists of 65 items, has shown an overall internal consistency of .92.

The Luebeck Preoperational Thinking Recording Scale (LQPT). LQPT, developed by Kühnen et al. (2011) to assess preoperational thinking in chronically depressed individuals, consists of 22 items with binary choices. Lower scores on a 0-22 range indicate higher levels of preoperational thinking. The original scale showed a Cronbach's alpha of $\alpha=0.90$ and a split-half reliability of 0.89. Its Turkish version, adapted by Uca (2016), maintains high reliability with a Cronbach's alpha of 0.89 and a split-half reliability of 0.90, confirming its suitability for research use in the Turkish context. In this study, Cronbach's alpha was found to be .89.

Patient Health Questionnaire -9 (PHQ-9). PHQ-9 was developed by Kurt Kroenke et al. (2001) using DSM-4 diagnostic criteria, which assesses depression with these diagnostic criteria. Sari et al. (2016) conducted the Turkish validity and reliability study, and Cronbach's alpha coefficient was reported as 0.84 (79). The scale consists of 9 questions scored between 0 (never) and 3 (almost every day). In the present study, internal consistency was calculated as .86.

Procedure

Statistical analysis

The IBM SPSS (v27) was used for data analysis. Data entries were checked before proceeding to the primary analyses, and missing data were analyzed. After

the missing data analysis, analyses were performed on the data of 163 participants. Skewness and kurtosis values, histograms, and expected probability graphs were examined for the sample to explore the normal distribution of the dataset. Skewness and kurtosis values in the data sets in the range of +1.5 -1.5 are generally acceptable values for normal distribution (Tabachnick & Fidell, 2013). In our study, since these values were between -1.23-1.26 and the histogram and expected probability graphs were close to normal distribution, it was accepted that the dataset showed normal distribution. A Kolmogorov-Smirnov test was performed for LQPT distribution in terms of groups (patients and healthy participants). In addition, homoscedasticity and multicollinearity assumptions were tested and before conducting the multiple linear regression analysis to test predicting variables of personality traits. The subscales of BPQ, which show a risk of multicollinearity and had a low correlation with the dependent variable, were not added to the analysis (Karagöz, 2017). This analysis was carried out with the data of 111 participants who completed all the scales used in the study and was found to be sufficient $N \geq 50+8m$ (Green, 1991). No outliers were observed. Welch's t-test, which has higher statistical power than Student's t-test, was used to compare LQPT scores of patients and healthy participants because of unequal variances and sample sizes (Delacre et al., 2017).

Results

Research findings are presented in this study were given in three stages. Firstly, the difference in preoperational thinking levels between the patient and healthy control group was assessed and then the relationships between preoperational thinking, depression, anxiety and personality traits were evaluated. Finally, it was examined whether the preoperational thinking level predicted personality traits by controlling the group, depression and anxiety levels of the participants.

The Difference between preoperational thinking Levels between Healthy and Patient Groups

A two-tailed independent sample t-test was compared to compare LQPT scores between patients and healthy group. Analysis results were significant $t(60.95) = -7.07, p < .001, d = 1.35$). According to these findings, the LQPT mean scores of the patient group were significantly higher than the mean scores of the healthy control group. The results are presented in Table 2.

Table 2. Comparing LQPT scores between patients and healthy group

Variable	Patients			Healthy group			<i>t</i>	<i>p</i>	<i>d</i>
	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>			
LQPT	14.90	4.50	48	19.80	2.49	102	-8.59	< .001	1.35

Note. *N* = 150. *df* = 148. *d* represents Cohen's *d*. LQPT: Luebeck Questionnaire for Recording Preoperational Thinking.

Relationships Between Scores Preoperational Thinking, Depression, Anxiety, and Personality Traits

As presented in Table 3, LQPT scores showed significant negative correlations with psychiatric symptoms (depression and GAD) and all personality traits except for narcissistic and schizoid. Specifically, LQPT scores were negatively correlated with PHQ ($r = -.39, p < .01$) and GAD ($r = -.36, p < .01$) scores. Additionally, LQPT scores showed a strong correlation with various personality traits. From the highest to the weakest level of correlation, LQPT scores were negatively correlated with dependent ($r = -.66, p < .01$), borderline ($r = -.65, p < .01$), Histrionic ($r = -.58, p < .01$), paranoid ($r = -.44, p < .01$), obsessive-compulsive ($r = -.44, p < .01$), avoidant ($r = -.41, p < .01$), passive-aggressive ($r = -.30, p < .05$) and antisocial ($r = -.23, p < .05$) traits. However, LQPT was not found to be significantly correlated with narcissistic and schizoid traits ($p > 0.05$).

Table 3. Pearson correlation matrix of primary variables in the study

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
1. LQPT	-												
2. PHQ	-.39**	-											
3. GAD	-.36**	.76**	-										
4. Avoidant	-.41**	.37**	.39**	-									
5. Dependent	-.66**	.44**	.42**	.50**	-								
6. OC	-.44**	.26**	.34**	.72**	.45**	-							
7. Antisocial	-.23*	.24*	.27**	.59**	.38**	.49**	-						
8. Narcissistic	-.13	.05	.14*	.48**	.35**	.48**	.50**	-					
9. Histrionic	-.58**	.21*	.22**	.52**	.68**	.56**	.54**	.46**	-				
10. Schizoid	.02	.15	.24*	.49**	.02	.37**	.41**	.45**	0.12	-			
11. Paranoid	-.44**	.46**	.42**	.66**	.54**	.60**	.68**	.41**	.58**	.52**	-		
12. Borderline	-.65**	.56**	.51**	.63**	.84**	.55**	.50**	.29**	.62**	0.17	.75**	-	
13. PA	-.30**	.34**	.37**	.63**	.43**	.49**	.64**	.57**	.59**	.57**	.70**	.45**	-

Note. * $p < 0.05$; ** $p < 0.01$; LQPT: Pre-operational thinking; PHQ: Patient Health Questionnaire-9; GAD: General Anxiety Disorder 7

Preoperational Thinking as a Predictor of Personality Traits

In a series of two-stage hierarchical regression analyses of variables predicting personality traits assessed using the PBQ subscales, adding LQPT as a predictor resulted in different changes in explained variance. At step 1, PHQ, GAD, and group (being in the healthy group) were entered as predictor variables. LQPT scores were added as predictor variables into the models in Step 2. Each step in the hierarchical regression was compared to the previous step using *F*-tests.

For the histrionic personality trait, the inclusion of LQPT scores resulted in an additional 28% variance explanation ($F(1, 107) = 46.64, p < .001, \Delta R^2 = .28$), indicating a strong relationship between LQPT scores and this trait. None of the variables was found to be significant predictors in the first model; LQPT scores ($B = -1.01, t(107) = -6.83, p < .001$) were significant predictors of histrionic trait scores in the second model. Similarly, in the dependent personality trait, LQPT explained an additional 22% of the variance ($F(1, 105) = 42.46, p < .001, \Delta R^2 = .22$), suggesting a significant relationship. Although being in the healthy group significantly predicted dependent personality trait scores in the first model, except for LQPT scores ($B = -0.75, t(105) = -6.52, p < .001$), none of the other variables were found to be significant in the second model. Borderline was found to be the third of the personality traits best explained by the unique contribution of LQPT scores. The addition of LQPT to the model significantly improved the prediction of borderline personality trait scores ($F(1, 104) = 25.56, p < .001, \Delta R^2 = .12$). This model indicates that adding LQPT scores explained an additional 12% of the variation in borderline trait scores. Being in the healthy group and PHQ scores were found to be significant predictors in the first model, LQPT scores ($B = -0.64, t(104) = -5.06, p < .001$) along with PHQ scores ($B = 0.25, t(104) = 2.23, p = .028$) was significant predictors of borderline personality trait scores in the second model.

Additionally, for the paranoid trait, although there was a significant improvement, the variance explained by the LQPT was relatively modest at 6% ($F(1, 104) = 8.68, p = .004, \Delta R^2 = .06$). In the case of the narcissistic trait, LQPT scores explained a further 5% of the variance ($F(1, 107) = 7.14, p = .009, \Delta R^2 = .05$). Finally, for the passive-aggressive trait, the addition of LQPT scores led to a 7% increase in variance explained ($F(1, 107) = 9.92, p = .002, \Delta R^2 = .07$). However, for the schizoid personality trait, the addition of LQPT scores to the model did not significantly improve its predictive ability ($F(1, 106) = 0.03, p = .869, \Delta R^2 = .00$), suggesting a negligible contribution of the LQPT in explaining schizoid trait variances.

Table 4. Summary of Hierarchical Regression Analysis for Variables Predicting Avoidant, Dependent, Obsessive-Compulsive, Antisocial, and Schizoid Personality Traits

DV	Step	Variables	<i>B</i>	<i>SE</i>	95.00% CI	β	<i>t</i>	<i>p</i>	ΔR^2	
Avoidant	Step 1	Group (HG)	-0.17	1.23	[-2.60, 2.27]	-0.01	-0.14	.892	.16	
		PHQ	0.14	0.14	[-0.14, 0.42]	0.15	1.01	.314		
		GAD	0.28	0.15	[-0.02, 0.57]	0.27	1.87	.064		
	Step 2	Group (HG)	1.78	1.30	[-0.80, 4.36]	0.15	1.37	.175		.08
		PHQ	0.10	0.13	[-0.17, 0.37]	0.10	0.74	.461		
		GAD	0.23	0.14	[-0.05, 0.51]	0.23	1.66	.101		
		LQPT	-0.49	0.14	[-0.78, -0.21]	-0.36	-3.41	< .001		
Dependent	Step 1	Group (HG)	-2.66	1.10	[-4.84, -0.49]	-0.23	-2.43	.017	.25	
		PHQ	0.21	0.13	[-0.04, 0.47]	0.23	1.68	.097		
		GAD	0.13	0.14	[-0.14, 0.40]	0.13	0.93	.354		
	Step 2	Group (HG)	0.20	1.03	[-1.84, 2.25]	0.02	0.20	.843		.22
		PHQ	0.13	0.11	[-0.09, 0.35]	0.14	1.20	.232		
		GAD	0.09	0.12	[-0.13, 0.32]	0.10	0.82	.414		
		LQPT	-0.75	0.11	[-0.98, -0.52]	-0.57	-6.52	< .001		
Obsessive-Compulsive	Step 1	Group (HG)	-1.69	1.29	[-4.25, 0.88]	-0.13	-1.30	.196	.13	
		PHQ	-0.04	0.15	[-0.34, 0.25]	-0.04	-0.29	.770		
		GAD	0.33	0.16	[0.02, 0.64]	0.31	2.10	.038		
	Step 2	Group (HG)	0.53	1.36	[-2.17, 3.23]	0.04	0.39	.695		.10
		PHQ	-0.09	0.14	[-0.37, 0.19]	-0.09	-0.65	.517		
		GAD	0.28	0.15	[-0.02, 0.57]	0.26	1.86	.065		
		LQPT	-0.56	0.15	[-0.85, -0.26]	-0.39	-3.71	< .001		
Antisocial	Step 1	Group (HG)	2.14	1.23	[-0.29, 4.57]	0.18	1.75	.084	.10	
		PHQ	0.07	0.14	[-0.21, 0.35]	0.08	0.50	.615		
		GAD	0.29	0.15	[-0.009, 0.58]	0.30	1.92	.057		
	Step 2	Group (HG)	3.61	1.32	[0.98, 6.23]	0.31	2.73	.008		.05
		PHQ	0.04	0.14	[-0.24, 0.31]	0.04	0.26	.793		
		GAD	0.26	0.15	[-0.03, 0.55]	0.27	1.77	.080		
		LQPT	-0.38	0.15	[-0.67, -0.09]	-0.28	-2.57	.011		
Schizoid	Step 1	Group (HG)	3.65	1.23	[1.22, 6.09]	0.31	2.97	.004	.13	
		PHQ	-0.03	0.14	[-0.31, 0.25]	-0.03	-0.20	.839		
		GAD	0.40	0.15	[0.11, 0.69]	0.41	2.71	.008		
	Step 2	Group (HG)	3.75	1.36	[1.04, 6.45]	0.32	2.75	.007		.00
		PHQ	-0.03	0.14	[-0.32, 0.25]	-0.03	-0.22	.823		
		GAD	0.40	0.15	[0.11, 0.69]	0.41	2.69	.008		
		LQPT	-0.03	0.16	[-0.34, 0.29]	-0.02	-0.16	.869		

Note. *B*: Unstandardized regression coefficients; β : Standardized regression coefficients

Table 5. Summary of Hierarchical Regression Analysis for Variables Predicting Paranoid, Narcissistic, Passive-Aggressive, Borderline, and Histrionic Personality Traits

DV	Step	Variables	<i>B</i>	<i>SE</i>	95.00% CI	β	<i>t</i>	<i>p</i>	ΔR^2
Paranoid	Step 1	Group (HG)	-0.11	1.38	[-2.63, 2.84]	-0.01	-0.08	.939	.22
		PHQ	0.39	0.16	[0.08, 0.71]	0.36	2.49	.014	
		GAD	0.15	0.16	[-0.17, 0.47]	0.14	0.95	.346	
	Step 2	Group (HG)	-1.85	1.46	[-1.04, 4.75]	-0.13	-1.27	.206	
		PHQ	0.34	0.15	[0.04, 0.65]	0.31	2.23	.028	
		GAD	0.09	0.16	[-0.22, 0.40]	0.08	0.57	.572	
LQPT	-0.51	0.17	[-0.86, -0.17]	-0.31	-2.95	.004			
Narcissistic	Step 1	Group (HG)	3.82	1.07	[1.70, 5.94]	0.37	3.57	< .001	.13
		PHQ	-0.10	0.12	[-0.35, 0.14]	-0.12	-0.83	.408	
		GAD	0.35	0.13	[0.10, 0.61]	0.41	2.77	.007	
	Step 2	Group (HG)	5.16	1.16	[2.87, 7.46]	0.50	4.47	< .001	
		PHQ	-0.13	0.12	[-0.37, 0.11]	-0.16	-1.11	.271	
		GAD	0.33	0.13	[0.08, 0.58]	0.38	2.62	.010	
LQPT	-0.34	0.13	[-0.60, -0.09]	-0.29	-2.67	.009			
Passive-Aggressive	Step 1	Group (HG)	2.24	1.04	[0.18, 4.30]	0.22	2.15	.034	.18
		PHQ	0.12	0.12	[-0.11, 0.36]	0.15	1.04	.299	
		GAD	0.31	0.12	[0.06, 0.56]	0.36	2.49	.014	
	Step 2	Group (HG)	3.76	1.11	[1.56, 5.95]	0.36	3.39	< .001	
		PHQ	0.09	0.12	[-0.14, 0.32]	0.11	0.78	.438	
		GAD	0.28	0.12	[0.04, 0.52]	0.33	2.33	.022	
LQPT	-0.39	0.12	[-0.63, -0.14]	-0.33	-3.15	.002			
Borderline	Step 1	Group (HG)	-3.17	1.07	[-5.30, -1.05]	-0.26	-2.96	.004	.38
		PHQ	0.34	0.12	[0.10, 0.58]	0.35	2.77	.007	
		GAD	0.10	0.13	[-0.15, 0.35]	0.10	0.79	.433	
	Step 2	Group (HG)	-1.17	1.04	[-3.24, 0.89]	-0.10	-1.13	.263	
		PHQ	0.25	0.11	[0.03, 0.47]	0.26	2.23	.028	
		GAD	0.04	0.11	[-0.18, 0.27]	0.04	0.37	.709	
LQPT	-0.64	0.13	[-0.88, -0.39]	-0.44	-5.06	< .001			
Histrionic	Step 1	Group (HG)	-1.79	1.44	[-4.63, 1.06]	-0.13	-1.24	.216	.07
		PHQ	0.10	0.16	[-0.23, 0.42]	0.09	0.58	.566	
		GAD	0.09	0.17	[-0.25, 0.43]	0.08	0.54	.588	
	Step 2	Group (HG)	2.19	1.34	[-0.46, 4.84]	0.16	1.64	.105	
		PHQ	0.00	0.14	[-0.27, 0.28]	0.00	0.03	.976	
		GAD	0.01	0.14	[-0.27, 0.30]	0.01	0.09	.925	
LQPT	-1.01	0.15	[-1.31, -0.72]	-0.66	-6.83	< .001			

Note. *B*: Unstandardized regression coefficients; β : Standardized regression coefficients

Table 6. Model comparisons for variables predicting personality traits

Dependent Variable	Model	R^2	df_{mod}	df_{res}	F	p	ΔR^2
Avoidant	Step 1	.16	3	107	6.99	< .001	.16
	Step 2	.25	1	106	11.64	< .001	.08
Dependent	Step 1	.25	3	106	11.80	< .001	.25
	Step 2	.47	1	105	42.46	< .001	.22
Obsessive-Compulsive	Step 1	.13	3	106	5.18	.002	.13
	Step 2	.23	1	105	13.74	< .001	.10
Antisocial	Step 1	.10	3	107	3.92	.011	.10
	Step 2	.15	1	106	6.63	.011	.05
Schizoid	Step 1	.13	3	107	5.38	.002	.13
	Step 2	.13	1	106	0.03	.869	.00
Paranoid	Step 1	.22	3	105	9.94	< .001	.22
	Step 2	.28	1	104	8.68	.004	.06
Narcissistic	Step 1	.13	3	108	5.59	.001	.13
	Step 2	.19	1	107	7.14	.009	.05
Passive-Aggressive	Step 1	.18	3	108	7.88	< .001	.18
	Step 2	.25	1	107	9.92	.002	.07
Borderline	Step 1	.38	3	105	21.06	< .001	.38
	Step 2	.50	1	104	25.56	< .001	.12
Histrionic	Step 1	.07	3	108	2.52	.061	.07
	Step 2	.35	1	107	46.64	< .001	.28

Note. Each Step was compared to the previous model in the hierarchical regression analysis.

Discussion

In this study, we examined the relationships between preoperational thinking, psychiatric symptoms (depression and GAD), and personality traits. We focused on depression, anxiety, and personality traits as predictors of preoperational thinking in a sample of individuals diagnosed with various psychiatric disorders and undiagnosed individuals. The study results revealed a diverse predictive role of LQPT scores across different personality traits. LQPT is highly predictive for traits like Histrionic and Dependent, moderately predictive for Borderline, Obsessive-Compulsive, and Antisocial, less predictive for Paranoid, Passive-Aggressive, and Narcissistic, and not predictive for schizoid personality traits.

The results of this study showed a significant relationship between an increase in general psychiatric symptoms (depression and anxiety) and an increase in preoperational thinking levels. It was also found that preoperational thinking was significantly higher in patients with psychiatric disorders (GAD, OCD, depression,

panic disorder). These findings support the results of previous research that provide a new interpretation of Piaget's work on the preoperational stage in the context of personality and psychiatric symptoms in adults. Inhelder & Piaget (1999) defined the preoperational stage as a period in which children's thought processes are not entirely logical, show egocentric tendencies, and cannot evaluate events from multiple perspectives. Limited perspectives and impulsive reactions in this stage characterize children's behavior. Therefore, the results of the present study have the potential to suggest that adults with psychiatric symptoms may experience similar cognitive limitations and provide essential clues about the cognitive aspects of disorders.

Kühnen et al. (2011) and Klein et al. (2018) reported that the severity of depression symptoms had a significant impact on the preoperational level and that LQPT scores differed significantly between patients with chronic depression and episodic depression. Similarly, Wilbertz (2010) reported a significant relationship between anxiety and preoperational thinking in chronically depressed patients. More specifically, they have found a negative association between clinician-rated egocentrism and anxiety. Moreover, Sondermann et al. (2020), reported a significant effect of preoperational thinking on the severity of depressive symptoms over the observation period was identified, suggesting that higher levels of preoperational thinking are associated with more severe depressive symptoms. These results can be interpreted as the higher the level of preoperational thinking, the higher the risk of depression and anxiety. Considering that preoperational thinking includes components such as snapshot perspective, prelogical thinking, and lack of perceived functionality, these findings also demonstrate the importance of understanding the cognitive behavioral theory's emphasis on the cognitive aspect of depression. Negative and unrealistic thought patterns about one's thoughts, world, and future are known to play a central role in the cognitive behavioral theory approach to depression and anxiety (Beck, 2002; Clark and Beck, 2010). CBT aims to recognize and replace these negative thought patterns with more realistic and positive ones. This process occurs when the therapist helps the individual to question their thoughts, feelings, and behaviors and to develop alternative interpretations. In this context, these findings provide evidence that therapies such as CBT used in the treatment of depression can help individuals recognize their limited and egocentric thought patterns and help them develop functional and more realistic cognition patterns.

CBASP, initially focusing on the link between preoperational thinking and psychopathology for treating chronic depression, proposes that such individuals often exhibit thought patterns described in Piaget's preoperational cognitive stages (McCullough, 2003). However, to the best of our knowledge, information in this field is limited to these studies. Therefore, considering that cognitive theory-based psychotherapies focused on preoperational thinking can produce effective results in working with psychiatric symptoms, it is thought that it would be essential to develop these therapy techniques and methods and to increase studies to examine their

effectiveness. In addition to cognitive interventions in the treatment of depression and anxiety, these findings suggest the importance of developing strategies to understand better and focus on the individual's cognitive processes. They may indicate that cognitive approaches to understanding and treating depression and anxiety should be further deepened.

This study also found significant relationships between preoperational thinking and personality traits and that preoperational thinking predict various personality traits. Similarly, Maheshwari & Chadha (2021) found correlations between personality traits and cognitive distortions, which may also be related to preoperational thinking. Although this aspect has not been well studied in the literature based on studies examined personality traits in understanding personality disorders (Berghuis et al., 2012; Deary et al., 1998; Warner et al., 2005), our results may be interpreted as being consistent with Leahy's (1995) and McCullough's (2003) perspectives on the potential relationship between preoperational thinking and personality disorders. The negative correlations between preoperational thinking and personality traits, such as histrionic, dependent, borderline personality traits, suggest that there may be a significant relationship between preoperational thinking and personality related psychiatric problems.

Moreover, it is essential in the context of Lane & Schwartz (1987) and Layden et al. (1993), which emphasized preoperational cognitive processes in personality disorders. In particular, the findings that preoperational thinking predicted histrionic, dependent and borderline traits may give clues to the relationship between personality beliefs and cognitive processing patterns. However, there is a very limited number of studies on this relationship and only studies on specific personality disorders. For example, histrionic personality belief is often characterized by a need for attention, superficial emotions, and dramatic or inappropriate behaviors to get attention (Bornstein, 1999; Pfohl, 1991). Such behaviors can often be associated with the satisfaction of immediate emotional needs consistent with preoperational thinking characterized by the difficulty in understanding intangible concepts and the inconsistency of perceptions with actual situations (Inhelder & Piaget, 1999).

Similarly, borderline personality disorder is associated with emotional instability, intense and volatile relationships, identity issues, and extreme detachment from reality, sometimes referred to as fragmentation (Leichsenring et al., 2011; Lieb et al., 2004). These traits may be compatible with a mindset that tends to see the world in black and white and has difficulty processing complex situations and understanding variances. Preoperational thinking refers to the self-centered and concrete ways of thinking in childhood. Borderline personality traits may reflect this thinking, as individuals often think and react according to their immediate emotional state. This can lead to impulsive and self-centered thinking processes inconsistent with real life.

Consequently, individuals' ways of perceiving and experiencing the world may affect personality traits by revealing preoperational cognitive processes.

Individuals with these personality traits may have more concrete and self-centered thought patterns that reflect their immediate emotional needs and escape from reality. These findings emphasize the importance of cognitive behavioral therapies in treating personality beliefs and suggest that these therapies would focus on developing individuals' cognitive processes to be more mature, aligned, and consistent with the real world. Therefore, the study findings support the theoretical perspectives presented in the literature (Leahy, 1995; McCullough, 2003; Lane & Schwartz, 1987; Layden et al., 1993) and suggest the importance of future studies on the complex relationship between personality traits, psychiatric symptoms, and preoperational thinking. As Farrell and Shaw (1994) emphasized, developing interventions that focus on the cognitive and emotional aspects of personality disorders, especially in therapeutic contexts, may increase the effectiveness of interventions developed for psychiatric disorders and the understanding of personality traits. More recently, Pakpahan and Saragih (2022) suggests that understanding and addressing the limitations of preoperational thinking in educational settings are crucial for fostering appropriate cognitive development and could influence personality development and the formation of schemas.

It should be noted that this study, which examined the relationships between preoperational thinking, personality traits, and psychiatric symptoms, has several limitations despite its strengths, such as the sample consisting of both diagnosed and healthy individuals and focusing on a unique and inadequately studied field. In particular, the limited number of diagnosed and healthy individuals in the sample limits the generalizability of the findings. Although there were no significant differences in sociodemographic characteristics such as age, education, income, gender, and marital status, the potential impact of these factors on cognitive and personality factors was not examined. Differences in gender and marital status distributions and income, especially in the healthy group, suggest that there may be potential underlying factors not accounted for in the statistical analysis. Furthermore, the cultural context of the study and the majority of the individuals included in the patient group being individuals with depression and obsessive-compulsive disorder limits the generalizability of the findings to other patient groups.

Authors' note

Declaration: The authors certify that they have no affiliations with or involvement in any organization or entity with any financial interest, or non-financial interest in the study and that the research has complied with APA ethical standards in the treatment of the participants. Portions of these findings were presented as a poster at the 2023 EABCT Congress Antalya Turkey.

Conflict of interest: None.

References

- Albein-Urios, N., Martinez-Gonzalez, J. M., Lozano-Rojas, O., & Verdejo-Garcia, A. (2019). Dysfunctional personality beliefs linked to emotion recognition deficits in individuals with cocaine addiction and personality disorders. *Frontiers in Psychiatry, 10*, [431]. <https://doi.org/10.3389/fpsy.2019.00431>
- Beck, A. T. (2002). Cognitive models of depression. *Clinical advances in cognitive psychotherapy: Theory and application, 14*(1), 29-61.
- Berghuis, H., Kamphuis, J. H., & Verheul, R. (2012). Core features of personality disorder: Differentiating general personality dysfunctioning from personality traits. *Journal of Personality Disorders, 26*(5):704-16. https://doi.org/10.1521/pedi_2012_26_028
- Bornstein, R. F. (1999). Histrionic personality disorder, physical attractiveness, and social adjustment. *Journal of Psychopathology and Behavioral Assessment, 21*, 79-94.
- Butler, A. C., Brown, G. K., Beck, A. T., & Grisham, J. R. (2002). Assessment of dysfunctional beliefs in borderline personality disorder. *Behaviour Research and Therapy, 40*(10), 1231–1240. [https://doi.org/10.1016/s0005-7967\(02\)00031-1](https://doi.org/10.1016/s0005-7967(02)00031-1)
- Clark, D. A., & Beck, A. T. (2010). Cognitive theory and therapy of anxiety and depression: convergence with neurobiological findings. *Trends in cognitive sciences, 14*(9), 418–424. <https://doi.org/10.1016/j.tics.2010.06.007>
- Cohen, J. (1988). *Statistical power analysis for the behavior sciences* (2nd ed.). West Publishing Company.
- Deary, I. J., Peter, A., Austin, E., & Gibson, G. (1998). Personality traits and personality disorders. *British Journal of Psychology, 89*(4), 647-661.
- Delacre, M., Lakens, D., & Leys, C. (2017). Why psychologists should by default use Welch's T-test instead of student's T-test. *International Review of Social Psychology, 35*(1). <https://doi.org/10.5334/irsp.661>
- Driscoll, K.A., Cukrowicz, K.C., Lyons Reardon, M., and Joiner, T.E. (2004). Simple treatments for complex problems a flexible cognitive behavior analysis system approach to psychotherapy. *New Jersey: Lawrence Erlb Aum Asso Ciates, Publishers.*
- Farrell, J. M., & Shaw, I. A. (1994). Emotional awareness training: A prerequisite to effective cognitive-behavioral treatment of borderline personality disorder. *Cognitive and Behavioral Practice, 1*(1), 71-91.
- Fonagy, P., & Bateman, A. W. (2016). Adversity, attachment, and mentalizing. *Comprehensive Psychiatry, 64*, 59–66. <https://doi.org/10.1016/j.comppsy.2015.11.006>
- Gan, S., Yu, Y., Wu, J., Tang, X., Zheng, Y., Wang, M., & Zhu, S. (2020). Preoperative assessment of cognitive function and risk assessment of cognitive impairment

- in elderly patients with orthopedics: A cross-sectional study. *BMC Anesthesiology*, 20(1). <https://doi.org/10.1186/s12871-020-01096-6>
- Green, S. B. (1991). How many subjects does it take to do a regression analysis. *Multivariate behavioral research*, 26(3), 499-510.
- Inhelder B. & Piaget J. (1999). The growth of logical thinking from childhood to adolescence: an essay on the construction of formal operational structures. New edition. Abingdon: Routledge
- Karagöz, Y. (2017). *Bilimsel araştırma yöntemleri ve yayın etiği*. Nobel Akademik Yayıncılık.
- Klein, J. P., Stahl, J., Hüppe, M., McCullough, J. P., Schramm, E., Ortel, D., Sondermann, S., Schröder, J., Moritz, S., & Schweiger, U. (2018). Do interpersonal fears mediate the association between childhood maltreatment and interpersonal skills deficits? A matched cross-sectional analysis. *Psychotherapy Research*, 30(2), 267–278. <https://doi.org/10.1080/10503307.2018.1532125>
- Kroenke, K., Spitzer, R. L., & Williams, J. B. (2001). The PHQ-9: validity of a brief depression severity measure. *Journal of general internal medicine*, 16(9), 606–613. <https://doi.org/10.1046/j.1525-1497.2001.016009606.x>
- Kühnen T, Knappke F, Otto T, Friedrich, S., Klein, J.P., Kahl, K.G., ..., Schweiger, U. (2011). Chronic depression: development and evaluation of the Luebeck questionnaire for recording preoperational thinking (LQPT). *BMC Psychiatry*, 11,199. <https://doi.org/10.1186/1471-244X-11-199>
- Lane, R. D., & Schwartz, G. E. (1987). Levels of emotional awareness: a cognitive-developmental theory and its application to psychopathology. *The American journal of psychiatry*, 144(2), 133-143.
- Layden, M.A., Newman, C.F., Freeman, A., & Morse, S.B. (1993). *Cognitive Therapy Of Borderline Personality Disorder*. Allyn ve Bacon.
- Leahy, R. L. (1995). Cognitive development and cognitive therapy. *Journal of Cognitive Psychotherapy*, 9(3), 173-184.
- Leichsenring, F., Leibing, E., Kruse, J., New, A. S., & Leweke, F. (2011). Borderline personality disorder. *The Lancet*, 377(9759), 74-84.
- Lieb, K., Zanarini, M. C., Schmahl, C., Linehan, M. M., & Bohus, M. (2004). Borderline personality disorder. *The Lancet*, 364(9432), 453-461.
- Maheshwari, K., & Chadha, Y. (2021). Correlation study between personality traits and cognitive distortions. *International Journal of Indian Psychology*, 9(1), 421-44.
- McCullough, Jr. J.P. (2003). Treatment for Chronic Depression Using Cognitive Behavioral Analysis System of Psychotherapy (CBASP). *JCLP/In Session*, 59(8), 833–846. <https://doi.org/10.1002/jclp.10176>.
- Osborne, J., & Waters, E. (2002). Four assumptions of multiple regression that researchers should always test. *Practical Assessment, Research & Evaluation*, 8(2), 1-9.

- Otani, K., Suzuki, A., Matsumoto, Y., & Shirata, T. (2018). Marked differences in core beliefs about self and others, between sociotropy and autonomy: Personality vulnerabilities in the cognitive model of depression. *Neuropsychiatric Disease and Treatment*, *14*, 863–866. <https://doi.org/10.2147/ndt.s161541>
- Piaget, J. (1950). *The psychology of intelligence*. London, UK: Routledge
- Piaget, J., & Inhelder, B. (2013). *The growth of logical thinking from childhood to adolescence: An essay on the construction of formal operational structures* (Vol. 84). Routledge.
- Pfohl, B. (1991). Histrionic personality disorder: A review of available data and recommendations for DSM-IV. *Journal of Personality Disorders*, *5*(2), 150-166.
- Ruxton, G. D. (2006). The unequal variance t-test is an underused alternative to Student's t-test and the Mann-Whitney U test. *Behavioral Ecology*, *17*(4), 688-690.
- Pakpahan, F. H., & Saragih, M. (2022). Theory of cognitive development by Jean Piaget. *Journal of Applied Linguistics*, *2*(1), 55-60.
- Sari, Y. E., Kokoglu, B., Balcioglu, H., Bilge, U., Çolak, E., & Ünlüoğlu, İ., (2016). Turkish reliability of the patient health questionnaire-9. *Biomedical Research-India*, *27*.
- Sargın, A. E., Özdel, K., & Türkçapar, M. H. (2017). Cognitive-behavioral theory and treatment of antisocial personality disorder. *Psychopathy - New Updates on an Old Phenomenon*. <https://doi.org/10.5772/intechopen.68986>
- Sargın, A. E., Uca, O., Kose, S., & Türkçapar, H. (2017). Reliability, validity, and factorial structure of the Turkish version of the Luebeck Questionnaire for recording preoperational thinking (Turkish LQPT). *Psychiatry and Clinical Psychopharmacology*, *28*(2), 191–198. <https://doi.org/10.1080/24750573.2017.1411575>
- Sondermann, S., Stahl, J., Grave, U., Outzen, J., Moritz, S., & Klein, J. P. (2020). Preoperational thinking as a measure of social cognition is associated with long-term course of depressive symptoms. A longitudinal study involving patients with depression and healthy controls. *Frontiers in Psychiatry*, *11*. <https://doi.org/10.3389/fpsy.2020.00652>
- Sperry, L., & Sperry, J. (2016). *Cognitive behavior therapy of DSM-5 personality disorders: Assessment, case conceptualization, and treatment*. Routledge.
- Tabachnick, B. G., Fidell, L. S., & Ullman, J. B. (2013). *Using multivariate statistics* (Vol. 6, pp. 497-516). Boston, MA: Pearson.
- Taymur, İ., Türkçapar, M. H., Örsel, S., Sargın, E., & Akkoyunlu, S. (2011). Kişilik inanç ölçeği-kısa formunun (kiö-ktf) Türkçe çevirisinin üniversite öğrencilerinde geçerlilik, güvenilirliği (Validity and Reliability of Turkish translation of personality Belief Questionnaire.) *Klinik psikiyatri*, *14*, 199-209.
- Wadsworth, B. (2004). *Piaget's Theory of Cognitive and Affective Development Foundations of Constructivism*. London Longman Publishing.

- Warner, M. B., Morey, L. C., Finch, J. F., Gunderson, J. G., Skodol, A. E., Sanislow, C. A., ... & Grilo, C. M. (2005). The longitudinal relationship of personality traits and disorders. *Focus, 113*(3), 217-477.
- Wilbertz, G., Brakemeier, E.-L., Zobel, I., Härter, M., & Schramm, E. (2010). Exploring preoperational features in Chronic Depression. *Journal of Affective Disorders, 124*(3), 262–269. <https://doi.org/10.1016/j.jad.2009.11.021>
- Wood, K. C., Smith, H., and Grossniklaus, D. (2001). *Piaget's Stages of Cognitive Development*. Emerging Perspectives on Learning, Teaching, and Technology. 1-8.