



THE ROLE OF LONELINESS, COGNITIVE FLEXIBILITY, AND  
INTERPERSONAL PROBLEM-SOLVING IN PREDICTING DARK TRIAD  
PERSONALITY OF UNIVERSITY STUDENTS

*Üniversite Öğrencilerinin Karanlık Üçlü Kişilik Özelliklerini Yordamada Yalnızlık, Bilişsel  
Esneklik ve Kişilerarası Problem Çözmenin Rolü*

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**ABSTRACT**

This study focuses on the variables that predict dark triad personality traits in university students. These variables are loneliness, cognitive flexibility, and interpersonal problem-solving. One hundred and sixty-six university students aged between 18-27 were recruited for this study. Data were collected using the dark triad scale, UCLA loneliness scale, cognitive flexibility scale, and interpersonal problem-solving inventory. Findings show that loneliness, cognitive flexibility and interpersonal problem solving together predict dark triad personality traits. The author observed that these variables explained 16% of the total variance in the machiavellian personality trait, 14% of the total variance in the narcissism personality trait, and 8% of the total variance in the psychopathy personality trait. More specifically; cognitive flexibility and lack of self-confidence predicted positively machiavellianism. On the other hand, constructive problem-solving predicts machiavellianism negatively and significantly. Taking no responsibility and approaching the problem negatively predict narcissism positively and significantly. Finally, the psychopathy personality trait is only positively predicted by the self-confident approach variable. The findings were discussed in the light of the current study, and recommendations were made for future research.

**ÖZ**

Bu çalışma, üniversite öğrencilerinde karanlık üçlü kişilik özelliklerini yordayan değişkenlere odaklanmaktadır. Bu değişkenler yalnızlık, bilişsel esneklik ve kişilerarası problem çözmedir. Bu çalışma için 18-27 yaşları arasında 166 üniversite öğrencisi araştırmaya dahil edilmiştir. Veriler karanlık üçlü ölçeği, UCLA yalnızlık ölçeği, bilişsel esneklik ölçeği ve kişilerarası problem çözme envanteri kullanılarak toplanmıştır. Bulgular, yalnızlık, bilişsel esneklik ve kişilerarası problem çözmenin karanlık üçlü kişilik özelliklerini etkilediğini göstermiştir. Bu değişkenlerin makyavel kişilik özelliğindeki toplam varyansın %16'sını, narsisizm kişilik özelliğindeki toplam varyansın %14'ünü ve psikopati kişilik özelliğindeki toplam varyansın %8'ini açıkladığı gözlenmiştir. Daha spesifik olarak; bilişsel esneklik ve özgüven eksikliği, makyavelizmi olumlu yönde yordamaktadır. Ayrıca bu değişkenler yapıcı problem çözmeyi olumsuz ve anlamlı bir şekilde yordamaktadır. Sorumluluk almamak ve probleme olumsuz yaklaşım narsisizmi olumlu ve anlamlı şekilde yordamaktadır. Son olarak, psikopati kişilik özelliği yalnızca kendine güvenli yaklaşım değişkeninden olumlu etkilenmektedir. Elde edilen bulgular mevcut çalışma ışığında tartışılmış ve gelecekte yapılacak araştırmalar için önerilerde bulunulmuştur.

**Anahtar Kelimeler**

Karanlık üçlü kişilik,  
Bilişsel esneklik, Yalnızlık,  
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## 1. Introduction

In recent years, there has been a tendency to consider personality as a social cognitive component. One of these social cognitive perspectives is the dark triad personality theory (Tozar, 2019). According to the view first put forward by Paulhus and Williams (2002), there are three socially undesirable personality traits, and these are interrelated. These features, which represent the dark side of the personality, are psychopathy, narcissism, and machiavellianism. Although these concepts evoke a personality disorder and a clinical phenomenon, Jones and Paulhus (2011) points out that some people in the general population may be more narcissistic, machiavellian, and psychopathic than others. Individuals with these personality structures are dominant have common characteristics such as selfishness, lacking depth, self-interested and manipulative attitudes in human relations (Jones & Paulhus, 2010). According to the classical psychoanalytic point of view, narcissism refers to the self-directedness of all sexual energy, or in other words, the libido. On the other hand, the modern psychoanalytic view sees narcissism as an unrealistic superior self-perception and defense mechanism (Levy, Ellison, & Reynoso, 2011). Miller and Maples (2011) define two distinct types of narcissism as grandiose and fragile. Grandiose narcissism is the type that is visibly aggressive and manipulative and builds its worthiness on the worthlessness of others. On the contrary, fragile narcissism refers to people that are more passive, shy, and have the unfulfilled need for attention. The primary characteristics of both are an inflated ego and disregard for others. According to the dark triad theory, those with high narcissism personality traits in their interpersonal relationships; are individuals who exaggerate their qualities, strive to be an authority, show off, are closed to criticism, focus on their interests, and lie. (Jonason & Webster, 2010).

Machiavellianism is a personality trait used by Christie and Geis (1970) to describe individuals with the way of thinking of rulers, based on the Italian philosopher Niccolo Machiavelli's "*The Ruler*." Machiavellianism is the idea that "Ends justify means" become a personality. Priorities of characters with such a dominant tendency are their lofty goals, and they do not hesitate to use others as a means to achieve these goals (McCabe & Smith, 2002). They may resort to lying, cheating, misdirection, fine calculations, and tactics with self-seeking motives with an attitude that celebrates personal interests and ignores virtues such as honesty and altruism (Jones & Paulhus, 2009). According to Jones and Paulhus (2009), some of the reasons for this are that they think that the world is full of unreliable and deceitful people, they are not doing anything wrong, and are just playing the game by the rules. Finally, psychopathy is a distinctive personality trait that can manifest itself with symptoms below the clinical level (Cleckley, 1976). Briefly, it expresses a tendency characterized by a disregard for others, impulsiveness, aggression, contempt, sarcasm, and immoral behavior in interpersonal relationships (Jones & Paulhus, 2002). Non-clinical psychopathic individuals may display cynical and condescending, unscrupulous, aggressive, and exploitative attitudes in their social relations (Babiak & Hare, 2006).

The developmental stage of university students; requires major developmental tasks such as establishing close relationships, friendships, and romantic bonds. Otherwise, individuals will encounter loneliness and isolation (Erikson, 1968). Loneliness is when individuals evaluate their current and ideal social relationships, they come to the conclusion that their current relationships are weaker than the ones they want to enter in terms of quality and quantity, and they complain about it (Peplau & Perlman, 1982). According to Younger (1995), more specifically, it indicates a situation in which the people have An incredible feeling of solitude, despite wanting to be with others. This phenomenon is especially critical in adolescence and young adulthood. In this developmental period, where establishing close friendships becomes essential, some young people may suffer from difficulties such as bullying, poor peer relations, exclusion, and social withdrawal (Dupper, 2013). Naturally, lonely young adults may miss out on the developmental advantages that positive and pleasant social relations can bring (Bullock, 1993). As a result, it can lead to maladaptive personality organizations such as the dark triad (Safak & Kahraman, 2019; Yabanci, 2019).

It is possible to say that being a socially preferred and adaptable person may also be related to cognitive flexibility and interpersonal problem-solving skills. According to Bilgin (2017), cognitive flexibility means not seeing the right option but options. Martin and Anderson (1998) defined cognitive flexibility as being aware of alternative ways, adapting to new situations, and feeling competent when flexible. Although cognitive flexibility resembles problem-solving, it differs by emphasizing the intellectual process towards the solution rather than the solution itself (Bilgin, 2009). Accordingly, Individuals who can see the options for their current situation are more flexible than those who do not consider other possible solutions even though they make the right decision (Beck, 1979). Individuals who can achieve this gain advantages, particularly in interpersonal

relations and harmonious personality organization. For example, cognitive flexibility can improve individuals' social competence, extroversion and problem-solving skills (Bilgin, 2009, 2017). On the other hand, interpersonal problem-solving refers to the ability of individuals to cope by producing effective cognitive and behavioral processes to eliminate the obstacles they encounter in their real life (D'Zurilla & Nezu, 1990). This phenomenon may gain importance, especially in interpersonal relationships. Attitudes to resolving interpersonal problems and conflicts can have more than one way. For example, Johnson and Johnson (2005) defined five strategies. These are withdrawal, settlement, compromise, use of force, or confrontation. Accordingly, individuals who encounter an interpersonal problem use one of these five strategies according to the importance of their demands, the person with whom they have difficulties, or the issue itself. As Cam and Tumkaya (2007) stated, individuals may be prone to various attitudes and behaviors such as constructive problem solving, insistent-persevering, negativity, lack of self-confidence, or taking no responsibility in the face of an interpersonal problem. Accordingly, constructive problem solving and insistent-persevering are attitudes and behaviors towards efficient problem solving, while others represent attitudes and behaviors related to ineffective interpersonal problem-solving.

Several studies in the literature suggest that prosocial traits and harmonious interpersonal interactions are associated with loneliness, cognitive flexibility, and interpersonal problem-solving. For example, Bilgin (2009, 2017) pointed out that high social competence and problem-solving skills increase cognitive flexibility, and individuals with high cognitive flexibility levels show more extroverted characteristics. As revealed in the studies of Buğa, Özkamali, Altunkol, and Cekic (2018), as cognitive flexibility increases, individuals have more positive attitudes towards interpersonal problem-solving and show more effective problem-solving skills. Celikkaleli (2014) also observed a positive and significant relationship between social competence and cognitive flexibility. Besides, as Sahin (2015) and Yelpeze (2021) mentioned, cognitive flexibility and interpersonal problem-solving affect loneliness negatively. In this respect, cognitive flexibility and interpersonal problem-solving skills may influence social competence and loneliness, as well as each other.

There is some evidence to suggest that loneliness, cognitive flexibility, and interpersonal problem-solving skills, which are important determinants of social relations, naturally will be predictors of socially undesirable psychopathy, narcissism, and machiavellianism. Many works show that loneliness, cognitive flexibility, and interpersonal problem solving are associated with social maladjustments, dysfunctions, or unwanted difficulties. For example, as demonstrated in several studies, loneliness is directly related to the consequences of social withdrawal such as problematic internet use, internet or gaming addiction (Batigun & Hasta, 2010; Cagir, 2010; Mert & Ozdemir, 2018; Oncel & Tekin, 2015). Similarly, it is thought that there is a positive correlation between lack of social support and aggression (Avci & Yildirim, 2014; Civitci, 2011; Odaci & Celik, 2017). In addition, narcissism, one of the dark triad personality traits, has been found to have a positive relationship with loneliness (Safak & Kahraman, 2019; Yabanci, 2019).

There are few studies on the predictive value of loneliness directly on dark triad traits, and these studies demonstrate that it increases with these traits and that there is a significant relationship between them. For example, Lang and Lenard (2015) found that childhood memories of loneliness and abuse are associated with prospective Machiavellianism. Hosman (1991) states that loneliness can affect individuals' communication motives, and lonely people may tend to put their interests first when communicating with others. In addition to these, other studies are showing that Machiavellianism and loneliness increase together (Bell & Daly, 2009; Berger & Palacios, 2014; Zhang, He, Huang, & Geng, 2016). As revealed in a recent study by Çelikkaleli, Karababa, and Adıgüzel (2022), the positive relationships between loneliness, psychopathy, and Machiavellianism are mediated by empathic tendency. Although no significant relationship was observed between narcissism and loneliness in the study of Çelikkaleli et al. (2022), studies are showing a positive relationship between these two variables (Masui, 2019; Safak & Kahraman, 2019). In the research of Zhang, Zou, Wang, and Finy (2015), it was noted that all three aspects of the dark triad showed positive relationships with loneliness.

It can be concluded that cognitive flexibility and interpersonal problem solving are related to socially maladaptive and undesirable traits. For example, Vila-Ballo et al. (2015) assert that the cognitive flexibility levels of violent juvenile delinquents differ significantly from others. As revealed in two other studies, aggression and argumentativeness are associated with cognitive flexibility (Chesebro & Martin, 2003; Martin, Weber, Mottet, Koehn, & Maffeo, 1998). In addition, cognitive flexibility, especially in young adulthood, is

seen as a significant predictor of adjustment problems (Burtovaya, 2020). According to the literature, the value of cognitive flexibility in predicting dark triad features is still unclear. Although there are consistent research findings that nonclinical psychopathy has a negative relationship with cognitive flexibility (Korshidi & Bozorgi, 2018; Walker et al., 2022), studies that draw attention to the relationship between the other two features of the dark triad and cognitive flexibility are ambivalent. For example, Bilgin (2009) states that cognitive flexibility protects individuals from adopting a machiavellian perspective, as it encourages prosocial ways of relating to others. Also, Khorshidi and Bozorgi (2018) observed that when cognitive flexibility increases, all three aspects of the dark triad weaken. On the other hand, some studies (Cranmer & Martin, 2015; Fatima & Shahid, 2020) revealed that the relationship between Machiavellianism and cognitive flexibility is positive, albeit at a low level. Jonason, Richardson, and Potter (2015) agree with this and point out that behaviors such as lying and manipulating others may require cognitive flexibility. Bereczkei (2018) compiled evidences for this argument and claimed that individuals with high scores on Machiavellianism scales are equipped with high cognitive and social skills that they do not use for other people, have developed rationality, the ability to think of different possibilities at the same time and have a tendency to behavioral and cognitive flexibility. It is also thought that the relationship between narcissism and cognitive flexibility may vary according to the subtypes of narcissism. For example, the research findings of Ng, Cheung, and Tam (2014) show that grandiose narcissism is associated with high flexibility in coping skills, while fragile narcissism is related with low flexibility in coping skills.

Similarly cognitive flexibility, as interpersonal problem-solving skills decrease; aggression (Arslan, 2010), anger (Yilmaz & Tuzgol Dost, 2016), narcissism (McMurran, Duggan, Christopher, & Huband, 2007), insecure attachment patterns (Stepp, Morse, Yaggi, Reynolds, Reed, & Pilkonis, 2008) negative psychosocial consequences such as bullying (Dincer, Bas, Teke, Aydin, Ipek, & Goktas, 2019) and social isolation increase (Pellegrini & Urbain, 1985). There are some studies that reveal the relationship between general or interpersonal problem-solving and dark triad personality traits. A common inference about narcissism from these studies is that narcissism and problem-solving styles that do not take responsibility/avoid responsibility are significantly related to each other (Abou & Kiamarsi, 2009; Birkas, Grass, Csatho, 2016). Also, Temel (2008) and McMurran, Duggan, Christopher, and Huband (2007) observed that impulsive/careless problem-solving is one of the frequent general problem-solving styles found in the narcissistic subtype of the dark triad. In addition to these, Temel (2008) noted that rational problem-solving also increased with narcissism. It is claimed that there is a flexibility and diversity, which comes from their ability to adapt to changing environmental conditions, in the interpersonal problem-solving styles of Machiavellians (Bereczkei, 2015). According to this, Machiavellians can use ways such as monitoring the behavior of others, seeking rewards, focusing on the task, and non-cooperation according to changing conditions. In study of Mesko, Lang, Czibor, Szijjarto, and Bereczkei (2014), it was observed that while machiavellians may show assertive, competitive or conciliatory conflict resolution attitudes, they generally do not want to solve the problem or cooperate. In addition to these, many studies indicate that as Machiavellian characteristics increase, the possibility of resorting to non-constructive ways such as dominance, tension, withdrawal, avoidance of dialogue, and creating tension in interpersonal conflicts increases (Brewer et al., 2018; Pilch, 2012; Zeigler-Hill & Vonk, 2015). There are very few studies on the relationship between non-clinical psychopathy and interpersonal problem-solving. A meta-analysis study indicates that all three subtypes (psychopathy, narcissism, and machiavellianism) of dark triad traits are associated with impairments in social problem-solving (Thoma, Friedmann, & Suchan, 2013). Also, Birkas, Grass, and Csatho's (2016) study claim that the most distinctive feature related interpersonal problem-solving of psychopathic types is not avoiding confrontation.

When the relevant literature is examined, although loneliness, cognitive flexibility, and interpersonal problem solving are addressed in terms of their relations with some variables that may be related to the dark triad, no study has been found that questions their predictive role on the dark triad. Understanding the factors affecting these personality traits may serve purposes such as promoting positive personality development in adolescents and young adults, preventing social adaptation problems, and even delinquency. For this reason, it is thought that this study will fill an important gap in the literature. Finally, the current research includes the following sub-problems:

- 1) Do loneliness, cognitive flexibility, and interpersonal problem-solving significantly predict machiavellian personality traits?

- 2) Do loneliness, cognitive flexibility, and interpersonal problem-solving significantly predict narcissistic personality traits?
- 3) Do loneliness, cognitive flexibility, and interpersonal problem-solving significantly predict psychopathy personality traits?

## **2. Materials and Method**

### **2.1. Research Model**

This research is a descriptive study based on a multiple linear regression analysis. Multiple linear regression analysis is a type of analysis that involves significantly predicting the dependent variable based on two or more independent variables (predictive variable). In this way, it is possible to understand how much of the variance in the dependent variable can be explained by the independent variables, which independent variable has a statistically significant role on the dependent variable, and in which direction the effect of the independent variables on the dependent variable (Buyukozturk, 2002).

### **2.2. Ethical Statement**

This study was completed by Helsinki Declaration. Following this, the study was examined and allowed by Ufuk University's Social and Human Sciences Scientific Research and Publication Ethics Committee (REF 2021/32). In addition to this, materials used in the research were just appropriated to volunteer participants. An informed consent form was provided to all participants. Additionally, participants were informed that they could withdraw from the study whenever during data collection.

### **2.3. Participants**

One hundred-sixty six university students aged between 18-27, 27 (16.3%) male and 139 (83.7%) female, participated in this research. 67 (40%) of the students are studying Guidance and Psychological Counseling, 43 (25.9%) Law, 40 (24.1%) English Language Teaching, and 16 (9.6%) other departments. Participants reached the scales through Google Forms. The informed consent form, personal information document, and the online questionnaire link with the scales were sent to the students via e-mail by the researcher.

## **2.4. Materials**

### **2.4.1. Dark triad dirty dozen.**

The Dark Triad Dirty Dozen Scale was developed by Jonason and Webster (2010), and the Turkish adaptation of the scale was made by Ozsoy, Rauthmann, Jonason, and Ardic (2017). The original and Turkish form of the scale consists of 12 items and three subscales (psychopathy, machiavellianism, and narcissism). It is a 5-point Likert-type scale (1 = strongly disagree, 5 = strongly agree). Each subscale has four items, and scores vary from 4 to 20. An increase in the scores obtained from the subscales means that the personality trait of that subscale increases. Adaptation studies of the scale were carried out with university students. The internal consistency coefficients of the subscales of the scale were .67, .80, and .81 for psychopathy, machiavellianism, and narcissism, respectively. Confirmatory factor analyzes showed that the three-factor model was congruent ( $\chi^2 = 103.67$ ,  $p < 0.01$ ,  $\chi^2 / df = 2.03$ , TLI = 0.95, CFI = 0.96, RMSEA = 0.05). It is seen that the Dark triad scale subscales show negative correlations with the agreeableness subscale of the five-factor personality scale and positive relationships with the other subscales. In addition, there is a positive correlation between the psychopathy subscale of the Dark triad and Levenson's Psychopathy subscale. It was observed that there were positive and significant relationships with the sub-dimensions of the Self-Report Scale.

### **2.4.2. Cognitive flexibility scale.**

The Cognitive Flexibility Scale was developed by Martin and Rubin (1995) and was adapted into Turkish by Altunkol (2011). It is a 6-point Likert scale (1=Strongly Disagree, 6=Strongly Agree) and consists of 12 items. 4 items are reverse scored (2, 3, 5, and 10). Scores from the scale range from 12 to 72, with high scores indicating a high level of cognitive flexibility. In the adaptation study, the internal consistency coefficient was found .81, and the two-week test-retest reliability was calculated as .73. -.14 and -.23 significant correlations with the Irrational Beliefs Test and Dysfunctional Attitudes Scale, and .54 with Bilgin's (2009) Cognitive Flexibility Scale.

### **2.4.3. UCLA Loneliness Scale**

The UCLA Loneliness Scale was developed by Russell, Peplau, and Ferguson (1978) and adapted to the Turkish sample by Demir (1989). The original and Turkish version of the scale consists of 20 items in a 4-point Likert type (1=I Have Never Experienced This Situation, 4=I Experience This Situation Frequently). The higher the scores obtained from the scale, the higher the level of loneliness. The internal consistency coefficient of the scale was .96, and the test-retest correlation was .94. In the adaptation study of the scale carried out with young and middle-aged adults, Demir (1989) stated that there was a significant difference in the scale scores of the participants who complained and did not complain about loneliness, in favor of those who complained. The findings regarding the criterion validity revealed that the UCLA loneliness scale showed a significant correlation of .77 with the Beck Depression Inventory and .82 with the Beck Depression Inventory Introversion Subscale.

### **2.4.4. Interpersonal Problem-Solving Inventory**

The interpersonal problem-solving inventory was developed by Çam and Tümkaya (2007) and consists of 5 Likert-type (1=Not at all Appropriate, 5=Completely Appropriate) 50 items and 5 subscales (Constructive problem solving, insistent-persevering, negativity, lack of self-confidence, and taking no responsibility). The scores vary between 16 and 80 for the negativity and constructive problem-solving sub-dimensions, between 7 and 35 for the lack of self-confidence sub-dimension, between 5 and 25 for the taking no responsibility sub-dimension, and between 6 and 30 for the insistent-persevering approach sub-dimension. Higher scores from the subscales indicate that the individual exhibits the characteristics of that subscale more. It was stated that the internal consistency coefficients of the subscale scores of the scale ranged between .67 and .91, and the factor loadings of the items ranged between .48 and .70. The criterion-related validity measurements of the scale were made by comparing them with the Problem Solving Inventory and the Trait Anxiety Inventory. Insistent-persevering approach subscales were also found to have a significant negative correlation with all subscales of the Problem-Solving Inventory. In addition, it was observed that the negative approach to the problem, lack of self-confidence, and taking no responsibility subscales showed significant relationships with the trait anxiety scale total scores, with coefficients of .57, .30, and .30, respectively.

## **2. 5. Data Analysis**

SPSS v26 statistical package program was used in the analysis of the data. Before the predictive analysis, it was examined whether the standard regression analysis had normality, linearity assumptions, autocorrelation, and multicollinearity problems. Multiple linear regression analysis was performed to investigate the variables predicting dark triad personality traits. Multiple linear regression analysis is a method in which all variables are included in the regression model, regardless of which variable has a significant contribution to the variance. Thus, it is possible to see the effect of all predictor variables on dependent variables (Buyukozturk, 2002). For this reason, multiple linear regression analysis was deemed appropriate in this study.

## **3. Results**

In this study, multiple linear regression analyses were used to examine variables that predict dark triad personality traits of university students. Before these analyses, Maholonobis distance values of participants were calculated by taking the  $p < .001$  criterion to determine whether there are extreme values. Accordingly, there are no excessive participants. To examine whether the normality and linearity assumptions were met, the kurtosis and skewness values of each variable were examined. Accordingly, these values are in the range (-1.5 to +1.5) suggested by Tabaschnick and Fidell (2013). It was observed that the histogram graph and normal distribution curves drawn for the standardized predicted values showed a distribution close to normal. In addition to this, it was observed that the scatter diagrams created for standardized predicted values and standardized residual values show linear relationships. Lastly, autocorrelation and multicollinearity problems were examined by considering the correlation matrix, Durbin-Watson statistics, VIF, and Tolerance values of the established models. It was observed that there was no autocorrelation or multicollinearity problem. The correlation matrix and descriptive statistics regarding the variables of the study are presented in Table 1.

**Table 1.** The findings of Pearson correlation between dark triad, cognitive flexibility, loneliness and interpersonal problem-solving

	Cognitive flexibility	Loneliness	Approaching problems negatively	Constructive problem-solving	Lack of self-confidence	Unwilling to take responsibility	Insistent-persevering approach
Machiavellianism	-.069	.076	.166*	-.233**	.274**	.204**	-.034
Psychopathy	-.124	.105	.048	-.151	.231**	.167*	-.159*
Narcissism	.045	.007	.227**	-.019	.138	.320**	.116
Cognitive flexibility	-	-.324**	-.412**	.513**	-.532**	-.094	.325**
Loneliness	-	-	.306**	-.063	.303**	.135	-.223**
Approaching problems negatively	-	-	-	-.059	.545**	.350**	.117
Constructive problem-solving	-	-	-	-	-.226**	-.082	.473**
Lack of self-confidence	-	-	-	-	-	.400**	-.150
Taking No Responsibility	-	-	-	-	-	-	.001
Insistent-persevering approach	-	-	-	-	-	-	-
X	54,77	39,5	46,31	57,04	12,51	11,34	22,39
Ss	7,91	13,57	15,46	10,99	4,39	4,09	4,19

X Machiavellianism =9,47 Ss Machiavellianism =3,86; X Psychopathy =8,02 Ss Psychopathy =2,93; X Narcissism =13,54 Ss Narcissism =3,45

\*p<.05 \*\*p<.001

According to Table 1, university students' machiavellian personality scores are correlated with cognitive flexibility scores at the level of .06, loneliness scores at the level of .07, insistent-persevering approach scores at the level of -.03, but these correlations are not significant. Machiavellian personality scores are correlated with approaching problems negatively scores at the level of .16 (p<.05), and constructive problem-solving scores at the level of -.23 (p<.01), lack of self-confidence scores at the level of .27 (p<.01), unwilling to take responsibility scores at the level of .20 (p<.01) significantly.. There is no significant correlations narcissism scores with cognitive flexibility, loneliness, constructive problem-solving, lack of self-confidence, and taking no responsibility. However, narcissism scores are correlated with approaching problems negatively scores at the level of .22 and taking no responsibility scores at the level of .32 (p<.01)., University students' psychopathy scores are no correlated with cognitive flexibility, loneliness, approaching problems negatively, and constructive problem-solving significantly. In spite of this, lack of self-confidence (r=.23, p<.01), taking no responsibility (r=.16, p<.01) and insistent persevering approach (r=-.15, p<.05) are correlated with psychopathy scores significantly..In Table 2, the results of multiple linear regression analysis regarding the prediction of dark triad personality traits according to cognitive flexibility, loneliness, and interpersonal problem-solving variables are given.

Considering the zero-order and partial correlations between the predictor variables and Machiavellian personality traits, although there is a correlation of  $r = -.06$  between Machiavellianism and cognitive flexibility, it is seen that this correlation is calculated at the level of  $r = .20$  when other variables are controlled. Zero-order and partial correlations between Machiavellianism and loneliness are at  $r = .07$  and  $r = .04$ , respectively. While the zero-order correlation calculated between Machiavellianism and approaching problems negatively is at the level of  $r = .16$ , it is seen to be at the level of  $r = .04$  when other variables are controlled. While the zero-order correlation calculated between constructive problem solving and Machiavellian personality traits is at the level of  $r = -.23$ , it is seen to be at the level of  $r = .27$  when other variables are controlled. Zero-order and partial correlations calculated between Machiavellianism and lack of self-confidence are at the level of  $r = .27$  and  $r = .22$ , respectively. Although the correlation between unwillingness to take responsibility and Machiavellianism is at the level of  $r = .20$ , when other variables are controlled, it is calculated as  $r = .05$ . Finally, it is seen that the zero-order correlation value calculated between the insistent-persevering approach and Machiavellianism is  $r = -.03$ , and the partial correlation value is  $r = .07$ .

The coexistence of cognitive flexibility, loneliness, and interpersonal problem-solving variables reveal a significant relationship with the machiavellianism scores, which is one of the dark triad personality traits of university students ( $R = .40$ ,  $R^2 = .16$ ,  $p < .000$ ). These variables explain approximately 16% of the total variance in Machiavellian personality traits. According to the beta coefficients, the order of importance of the predictor variables on the machiavellian personality trait: constructive problem solving, lack of self-confidence, cognitive flexibility, insistent-persevering approach, unwillingness to take responsibility, approaching problems negatively, and loneliness. The t-test results regarding the significance of these coefficients showed

that only constructive problem solving, lack of self-confidence, and cognitive flexibility variables were significant predictors of machiavellian personality traits.

**Table 2.** The findings of multiple linear regression analysis regarding the prediction of dark triad personality traits according to cognitive flexibility, loneliness, and interpersonal problem-solving.

Variable	B	Standart Error	Beta	t	p	Zero-order r	Partial r
<b>Machiavellianism</b>							
Constant	2.16	3.3		.64	.52		
Cognitive flexibility	.13	.05	.27	2.57	.01	-.06	.20
Loneliness	.01	.02	.04	.60	.54	.07	.04
Approaching problems negatively	.01	.02	.05	.58	.56	.16	.04
Constructive problem-solving	-.11	.03	-.33	-3.57	.00	-.23	-.27
Lack of self-confidence	.25	.08	.28	2.82	.00	.27	.22
Unwilling to take responsibility	.05	.07	.06	.74	.45	.20	.05
Insistent-perevering approach	.07	.08	.08	.93	.35	-.03	.07
Multiple R= .40, R <sup>2</sup> = .16, Adj R <sup>2</sup> = .12, F <sub>(7, 158)</sub> = 4.31, p<.001							
<b>Narcissism</b>							
Constant	5.178	3.036		1.70	.09		
Cognitive flexibility	.08	.04	.18	1.75	.08	.04	.13
Loneliness	-.00	.02	-.02	-.24	.80	.00	-.01
Approaching problems negatively	.04	.02	.19	1.96	.05	.22	.15
Constructive problem-solving	-.03	.03	-.12	-1.27	.20	-.01	-.10
Lack of self-confidence	.01	.08	.02	.23	.81	.13	.01
Unwilling to take responsibility	.21	.07	.25	3.04	.00	.32	.23
Insistent-perevering approach	.07	.07	.08	.98	.32	.11	.07
Multiple R= .38, R <sup>2</sup> = .14, Adj R <sup>2</sup> = .11, F <sub>(7, 158)</sub> = 3.94, p<.001							
<b>Psychopathy</b>							
Constant	7.355	2.66		2.75	.00		
Cognitive flexibility	.01	.04	.04	.41	.68	-.12	.03
Loneliness	.01	.01	.04	.54	.59	.10	.04
Approaching problems negatively	-.01	.01	-.10	-1.00	.31	.04	-.08
Constructive problem-solving	-.02	.02	-.08	-.82	.41	-.15	-.06
Lack of self-confidence	.15	.07	.22	2.13	.03	.23	.16
Unwilling to take responsibility	.07	.06	.10	1.21	.22	.16	.09
Insistent-perevering approach	-.05	.06	-.08	-.86	.38	-.15	-.06
Multiple R= .29, R <sup>2</sup> = .08, Adj R <sup>2</sup> = .04, F <sub>(7, 158)</sub> = 2.19, p<.05							

Considering the zero-order and partial correlations between the predictor variables and narcissism personality traits, although there is a relationship between narcissism and cognitive flexibility at the level of  $r=.04$ , when other variables are controlled, it is seen as  $r=.13$ . Zero-order and partial correlations between narcissism and loneliness are at the level of  $r=.00$  and  $r=-.01$ , respectively. While the zero-order positive correlation between narcissism and approaching problems negatively is at the level of  $r=.22$ , it is seen to be at the level of  $r=.15$  when other variables are controlled. While the zero-order correlation between constructive problem solving and narcissism personality traits is at the level of  $r=-.01$ , it is seen to be at the level of  $r=-.10$  when other variables are controlled. Zero-order and partial correlations between narcissism and lack of self-confidence are at the level of  $r=.13$  and  $r=.01$ , respectively. Although the correlation between unwillingness to take responsibility and narcissism is at the level of  $r=.32$ , when other variables are controlled, it is at the level of  $r=.23$ . Finally, it is seen that the zero-order correlation value calculated between the insistent-persevering approach and narcissism is  $r=-.11$ , and the partial correlation value is  $r=.07$ .

The coexistence of cognitive flexibility, loneliness, and interpersonal problem-solving variables show a significant relationship with the narcissism scores, which is one of the dark triad personality traits of university students ( $R=.38$ ,  $R^2=.14$ ,  $p<.001$ ). These variables explain approximately 14% of the total variance in narcissistic personality traits. According to the beta coefficients, the order of importance of the predictor variables on the narcissistic personality trait: Unwillingness to take responsibility, approaching problems negatively, cognitive flexibility, constructive problem-solving, insistent-persevering approach, lack of self-confidence, and loneliness. The t-test results regarding the significance of these coefficients showed that only



unwillingness to take responsibility and approaching problems negatively variables were significant predictors of narcissistic personality traits.

Considering the zero-order and partial correlations between the predictor variables and psychopathy personality traits; Although there is a negative relationship between psychopathy and cognitive flexibility at the level of  $r = -.12$  when other variables are controlled, it is seen that this correlation is at the level of  $r = .03$ . Zero-order and partial correlations between psychopathy and loneliness are at the level of  $r = .10$  and  $r = .04$ , respectively. While the zero-order positive correlation between psychopathy and approaching problems negatively is at the level of  $r = .04$ , it is seen at the level of  $r = -.08$  when other variables are controlled. While the zero-order correlation between constructive problem solving and psychopathy personality traits is at the level of  $r = -.15$ , it is seen to be at the level of  $r = -.06$  when other variables are controlled. Zero-order and partial correlations between psychopathy and lack of self-confidence are at the level of  $r = .23$  and  $r = .16$ , respectively. Although the correlation between unwillingness to take responsibility and psychopathy is at the level of  $r = .16$ , when other variables are controlled, it is at the level of  $r = .09$ . Finally, it is seen that the zero-order correlation value calculated between the insistent-persevering approach and psychopathy is  $r = -.15$ , and the partial correlation value is  $r = -.06$ .

The coexistence of cognitive flexibility, loneliness, and interpersonal problem-solving variables show a significant relationship with the psychopathy scores, which is one of the dark triad personality traits of university students ( $R = .29$ ,  $R^2 = .08$ ,  $p < .05$ ). These variables explain approximately 8% of the total variance in psychopathy personality traits. According to the beta coefficients, the order of importance of the predictor variables on the psychopathy personality trait: Lack of self-confidence, unwillingness to take responsibility, approaching problems negatively, constructive problem-solving, insistent-persevering approach, cognitive flexibility, and loneliness. The t-test results regarding the significance of these coefficients showed that only unwillingness to take responsibility and approaching problems negatively variables were significant predictors of psychopathy personality traits.

#### **4. Discussion, Conclusion and Recommendations**

The findings of the research show that cognitive flexibility, self-confidence, and constructive problem-solving significantly predict the machiavellian personality trait. Also, it is possible to say that unwillingness to take responsibility in interpersonal problem-solving and approaching problems negatively predict narcissism significantly, and lack of self-confidence in interpersonal problem-solving has a predictor role on psychopathy personality. However, it is seen that the variables of insistent-persevering approach to interpersonal problem solving and loneliness do not have a significant predictive role on any of the dark triad personality traits.

Machiavellianism includes not adhering to traditional moral values, not believing in human kindness, and manipulative communication to achieve their goals (Christie & Geis, 1970). In addition to these basic features, a crucial factor that distinguishes the machiavellian personality from the other two dark aspects of the personality (narcissism and psychopathy) is the cognitive capacities of the machiavellian individuals. There are findings that those with dominant machiavellian personality traits have a brighter intelligence than the general population (Kowalski, Kwiatkowska, Kwiatkowska, Ponikiewska, Rogoza, & Schermer, 2018). Cognitive flexibility is a phenomenon related to intelligence, which includes the ability of an individual to see more than one option at the same time and to be flexible in the face of new situations (Colzato, Woume, Lavender, & Hommel, 2006). In this respect, individuals with high machiavellian personality traits can be cognitively flexible (Fatima & Shahid, 2020). Bereczkei (2015) states that individuals who can maintain self-interested relationships for many years, especially despite their high level of machiavellian characteristics, can adapt to changing conditions and new social situations and update their behaviors. It is also true for Machiavellianists who have long-term romantic relationships (Jones & Roos, 2017). It is a known fact that as the level of cognitive flexibility increases, rigid moral attitudes decrease, and a more flexible moral understanding dominates (Cranmer & Martin, 2015). In the study of Cranmer and Martin (2015), it is seen that as the level of cognitive flexibility increase, machiavellian beliefs increase but rigid moral attitudes decrease. This result explains the positive relationship between cognitive flexibility and Machiavellianism from moral understanding. On the other hand, it may be necessary to consider that machiavellian individuals do not hesitate to lie in order to protect their own interests (Jonason et al., 2015). The findings of this study are based on participants' self-reports. Although it was assumed that these self-reports were made honestly and sincerely, it

is possible that individuals with high scores on the Machiavellianism subscale may have exaggerated their cognitive flexibility levels. As a matter of fact, there are studies in the literature suggesting a negative relationship between machiavellianism and cognitive flexibility (Bilgin, 2009; Khorshidi & Bozorgi, 2018). Lack of self-confidence in interpersonal problem-solving refers to the individual's self-doubt for the solution in the face of the problem. On the other hand, constructive problem solving refers to the person's carrying the cognition, emotions, and behaviors that will enable the problem to be solved effectively in the face of the interpersonal problem and to act by considering how this problem affects the people around him or how they will be affected by the solution (Cam & Tumkaya, 2007). When viewed from this aspect, constructive problem-solving contradicts Machiavellianism values in this respect. They do not hesitate to be destructive if it is for their benefit, and they see it right (Christie & Geis, 1970). There are studies in the literature that as the Machiavellian characteristics of individuals increase, they use destructive conflict resolution strategies such as tension, dominance, and withdrawal more, and strategies such as reconciliation and dialogue-less (Brewer et al., 2018; Pilch, 2012; Zeigler-Hill & Vonk, 2015). In this respect, it is possible to predict that individuals who have developed constructive problem-solving strategies will be less machiavellian. The positive relationship revealed between lack of self-confidence in interpersonal problem-solving and machiavellian personality in this study may be associated with gender differences. For example, Machiavellianism is related to harm avoidance, anxiety, skepticism, and vulnerability among women. However, it is associated with self-confidence, risk-taking, and an opportunistic worldview among men (Czibor, et al., 2017). this relationship is understandable, and it is seen that there are results to support the research of Czibor et al. (2017) by considering that the majority of the participants of the study are women.

Nonclinical narcissism is associated with smugness, inflated self, arrogance, pretentiousness, self-seeking manipulative behaviors, indifference to others, to seek admiration from others, and superiority sense (Ackerman, Witt, Donnellan, Trzesniewski, Robins, & Kashy, 2011). These features, which become more visible when they are with other people, limit the interpersonal problem-solving ways and approaches of individuals with high narcissistic personality traits (Temel, 2008). In this study, it is seen that unwillingness to take responsibility in interpersonal problem solving and approaching problems negatively predict narcissistic personality traits positively. Approaching problems negatively means giving harmful emotional reactions such as helplessness, pessimism, and sadness in case of encountering an interpersonal problem. Taking no responsibility is not taking the initiative to solve the problem, expecting an apology or regret from the other party, thinking that there is no mistake, and not trying to change the situation (Cam & Tumkaya, 2007). Maydeu-Olivares and D'Zurilla (1996) stated that approaching problems negatively and taking no responsibility/avoidance are related. Also, they asserted that negative approaches such as thinking that the problem is not solvable and considering it unimportant push the person not to take responsibility. Although people with high narcissism personality traits are task-oriented, planned, self-controlled, and assertive in general problem solving, they may not accept responsibility when the problem is interpersonal (Birkas, Gacs, & Csato, 2016). Abou and Kiamarsi (2009) observed similar results, and they revealed that as narcissism increased, approaching problems negatively and avoidantly increased. In this respect, the findings of this study are also supported by the literature.

Nonclinical psychopathy includes characteristics such as risk-taking, low self-control, lack of remorse, lying, manipulation, composure, inability to empathize, unreliability, not deriving lessons from mistakes, lack of love, and anti-social behavior for simple reasons (Cleckley, 1976). There are few studies showing the relationship between social competence and psychopathy. Swanson (2021) revealed that low social competence in childhood and adolescence predicted high psychopathy symptoms in the future. In another study, Ardic and Ozsoy (2020) found a significant negative relationship between social competence and non-clinical psychopathy. According to Bilgin (1999), social competence expectation refers to a person's perception of himself as someone who can act adequately in the face of various social situations and interpersonal relationships. The low expectation of social competence in individuals with psychopathy personality traits may cause them to experience a lack of self-confidence in interpersonal problem-solving. As a matter of fact, in this study, it was observed that lack of self-confidence in interpersonal problem solving significantly predicted psychopathy personality traits. Moreover, studies have shown that other psychopathy-related features such as aggression and hostility increase along with lack of self-confidence in interpersonal problem solving (Arslan, Hamarta, Arslan & Saygin, 2010; Ergin & Dag, 2012). In this regard, it can be said that individuals with

psychopathy personality traits are aware of the ineffectiveness of their interpersonal problem-solving skills. To sum up, lack of self-confidence in interpersonal problem solving predicts machiavellian and psychopathy personality traits positively. While there is a significant negative relationship between Machiavellian personality traits and constructive problem solving, there is a significant positive relationship between cognitive flexibility and Machiavellian personality traits. It has been observed that the narcissistic personality trait is positively predicted by the variables of unwillingness to take responsibility in interpersonal problem-solving and approaching problems negatively. All in all, it is seen that interpersonal problem-solving has a stronger role than cognitive flexibility and loneliness in predicting dark triad personality traits. While loneliness isn't related to any of the dark triad personality traits, cognitive flexibility shows a significant relationship only with machiavellianism. On the other hand, different dimensions of interpersonal problem-solving show mildly significant relationships with each dark triad personality trait. Therefore, the current research suggests the importance of improving interpersonal problem-solving in the primary prevention of some antisocial behaviors related to machiavellianism, narcissism, and psychopathy. The research has limitations in several aspects. First of all, it took place in a context under the influence of the Covid-19 pandemic. For this reason, university students who had been studying online for about a year and could not socialize participated in the research. These conditions are critical factors that may have influenced the research results. In this regard, in future studies, it would be appropriate to collect data from a larger group of participants from a context where social life was not affected by the epidemic. In addition, it would be beneficial to expand the literature with studies that examine the effects of other variables that may be associated with dark triad personality. Studies with younger age groups are also needed. Finally, it would be wrong to perceive the dark personality traits discussed here as pure negativity. These traits are some of the darker aspects of personality, and scale development studies are needed to illuminate them.

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#### **Etik, Beyan ve Açıklamalar**

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**1. Etik Kurul izni ile ilgili;**

Bu çalışmanın yazar/yazarları, Ufuk Üniversitesi Sosyal ve İnsan Bilimleri Araştırma ve Yayın Etik Kurulu'nun 24.03.2021 tarihli REF2021/32 sayılı karar ile etik kurul izin belgesi almış olduklarını beyan etmektedir.

**2. Bu çalışmanın yazar/yazarları, araştırma ve yayın etiği ilkelerine uyduklarını kabul etmektedir.**

**3. Bu çalışmanın yazar/yazarları kullanmış oldukları resim, şekil, fotoğraf ve benzeri belgelerin kullanımında tüm sorumlulukları kabul etmektedir.**

**4. Bu çalışmanın benzerlik raporu bulunmaktadır.**

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