

Optimism and happiness in undergraduate students: Cognitive flexibility and adjustment to university life as mediators

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Título: Optimismo y felicidad en estudiantes universitarios: flexibilidad cognitiva y adaptación a la vida universitaria como mediadores.

Resumen: De acuerdo con el objetivo del enfoque de psicología positiva, este estudio fue diseñado para construir una comprensión de las relaciones entre optimismo, flexibilidad cognitiva, ajuste a la vida universitaria y felicidad mediante la propuesta de un modelo de mediación múltiple. Un total de 386 estudiantes universitarios (64% mujeres y 36% hombres) entre 18-22 años participaron en el estudio. Los participantes fueron reclutados de una pequeña universidad en Turquía. El Test de Orientación de Vida, el Inventario de Flexibilidad Cognitiva, la Escala de Vida Universitaria y el Formulario Corto del Cuestionario de Felicidad de Oxford fueron utilizados como medidas. Los resultados mostraron que el optimismo, la flexibilidad cognitiva, el ajuste a la vida universitaria y la felicidad se correlacionan positivamente. Los resultados de los análisis mediacionales también indicaron que la mediación serial múltiple de la flexibilidad cognitiva y el ajuste a la vida universitaria en el modelo hipotetizado fue estadísticamente significativa y explicaron aproximadamente el 50% de la varianza en la felicidad.

Palabras clave: optimismo, felicidad, flexibilidad cognitiva, adaptación a la vida universitaria.

Abstract: In accordance with the goal of the positive psychology approach, this study was designed to build an understanding of the relationships among optimism, cognitive flexibility, adjustment to university life and happiness by proposing a multiple mediation model. A total of 386 undergraduates (64% female and 36% male) between 18-22 years participated in the study. The participants were recruited from a small university in Turkey. The Life Orientation Test, Cognitive Flexibility Inventory, University Life Scale, and Oxford Happiness Questionnaire Short Form were utilized as measures. The results showed that optimism, cognitive flexibility, adjustment to university life, and happiness positively correlated. The findings from the mediational analyses also indicated that the serial multiple mediation of cognitive flexibility and adjustment to university life in the hypothetical model was statistically significant and explained approximately 50% of the variance in happiness.

Keywords: optimism, happiness, cognitive flexibility, adjustment to university life.

Introducción

Positive psychology approach, which emphasizes the strengths of a person and maximizes human functionality, seeks to understand the factors affecting the development of individuals and communities for the discovery and promotion of human strengths (Seligman, 2002). The essential propose of this approach is to understand and enhance well-being. In the literature, *well-being* and *happiness* are often used interchangeably (Theobald & Cooper, 2012). The World Health Organization (2004) defines well-being as “positive mental health,” while some researchers have described well-being as “happiness” (Linley, Maltby, Wood, Osborne, & Hurling, 2009). For example, Mroczek and Kolarz (1998) see *happiness* as a synonym of *well-being*. Further, there are some systematic explanations of happiness. Hedonic well-being, also known as subjective well-being, is defined as positive emotions and mental experiences that occur frequently, negative emotions and moods being rarely experienced, and a high level of life satisfaction (Diener, 1984). The eudaimonic perspective of well-being, conceptualized by the psychological well-being model of Ryff (1989), describes eudaimonia (“eu” = good and “daimon” = spirit) with terms like *welfare*, *happiness*, and *flourishing* while focusing on how individuals struggle to demonstrate full functionality and gain awareness of their unique talents. Other researchers have conceptualized happiness as including three constituents: “1) the frequency and degree of positive affect, or joy, 2) the average level of satisfaction over a period, and 3) the absence of negative feelings, such as depression and anxiety” (Argyle & Lu, 1990, p. 1012).

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Happiness literature has provided considerable evidence regarding the correlates of this positive construct in college students. For example, Flynn and Macleod (2015) revealed that self-esteem and academic success are important predictors of students’ happiness. Cheng (2001) found, on a sample of first-year undergraduate students, that an optimistic attributional style (especially in positive situations) correlated with happiness. It was also demonstrated that self-liking, self-competence, and cognitive reappraisal contributed the most to the happiness of university students (Demirtaş, 2018). Other studies found that happiness was associated with a number of variables, such as motivational orientation, efficacy beliefs, personality traits, and sustainable behavior (Asıcı & İkiz, 2015; Choi, 2016; Doğan, 2013; Lee & Padilla, 2016; Nowell, 2017; Pacheco & Kamble, 2016; Ziapour, Khatony, Jafari, & Kianipour, 2018).

These findings suggest that the research concerning the contributing factors on happiness has important outcomes in understanding positive youth development. To our knowledge, although the connection between optimism and happiness is well researched, their associations with cognitive flexibility and adjustment to university life have not been well studied. As the association between these variables are considered to have crucial effects on undergraduates’ happiness, it was supposed that cognitive flexibility and adjustment to university life could mediate the relation between optimism and happiness (Figure 1).

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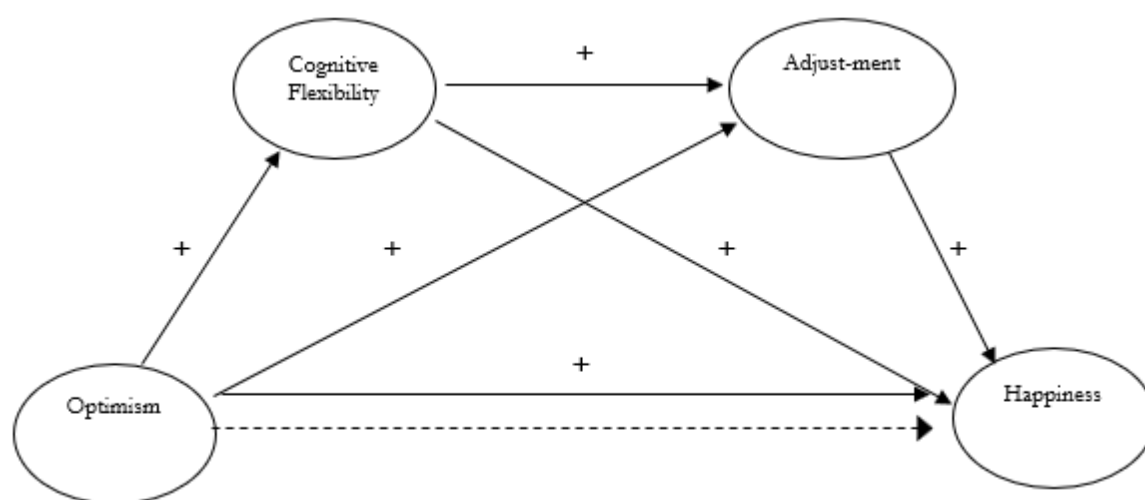


Figure 1. Hypothesized Model.

Optimism and Happiness

One personal characteristic connected to happiness is optimism. Dispositional optimism, which is rooted in the behavioral self-regulation model theorized by Scheier and Carver (1988), is conceptualized as “the tendency to believe that one will generally experience good vs. bad outcomes in life” (Scheier & Carver, 1992, p. 203). If people believe in favorable outcomes, they have the confidence to maintain their efforts to achieve their goals even if they encounter obstacles (Carver & Scheier, 1990). The important role that expectations play in this model has led to the exploration of the behavioral and emotional effects of individual differences in optimism and pessimism (Scheier, Carver, & Bridges, 1994). Studies on optimism have provided ample evidence that it has many beneficial qualities linking the quality of life and plays an essential role on physical and mental health (Seligman & Csikszentmihalyi, 2000). Previous studies have also showed that optimism predicts physical well-being (Wimberly, Carver, & Antoni, 2008), life satisfaction (Leung, Moneta, & McBride-Chang, 2005), subjective well-being (Isaacowitz, 2001; Daukantaitė & Bergman, 2005; Vazquez, 2009; Sahai & Singh, 2017; Duy & Yıldız, 2017), psychological well-being (Coups, 2003; Heo, Chun, Lee, & Kim, 2016) and emotional well-being (Matthews & Cook, 2009). The association between optimism and well-being is considered to be a function of the effective coping strategies used by optimistic individuals (Conversano et al., 2010), and experience more positive emotions (Carver & Scheier, 2014).

Cognitive Flexibility

Based on the above explanations, this study proposes another psychological construct, “cognitive flexibility”, that may reveal the association between optimism and happiness. Research suggest that the core constituent of cognitive flexi-

bility is “the ability to switch cognitive sets to adapt to the changing environmental stimuli” (Dennis & Vander-Wal, 2010, p. 242). Martin and Rubin (1995), defined this construct as an individual’s “(a) awareness that in any given situation, there are options and alternatives available, (b) willingness to be flexible and adapt to the situation, and (c) self-efficacy in being flexible” (p. 1). Cognitive flexibility refers to the ability of individuals to think and deal with different views in flexible styles and regulate their problem-solving plans as the demands of the task change (Al Jabari, 2012; De Dreu, Baas, & Nijstad, 2008). Previous studies have found that cognitive flexibility has been positively related to better psychological health, including negative mood states (Kato, 2012), psychological well-being (Cardom, 2016; Fu & Chow, 2017), interpersonal competence (Rubin & Martin, 1994), life satisfaction (Çiknkcı, 2018), and happiness (Asıcı & İkiz, 2015).

Although there is very limited research (e.g. Doğan-Laçın & Yalçın, 2018; Sapmaz & Doğan, 2013) to support the direct link between optimism and cognitive flexibility, the positive affect that accompanies optimism is considered to be associated with cognitive flexibility that encourages the generation of multiple solutions to everyday problems (Johnson, Waugh, & Fredrickson, 2010). Optimism promotes cognitive flexibility, suggesting that thinking more about positive outcomes enhances individuals’ awareness of the available cognitive alternatives and to control the course of their actions, even in times of adversity. Generalized positive outcome expectancies stemming from optimism are considered to enhance cognitive flexibility, reduce negative emotions, and develop resilience against distress (Cousins, Tomlinson, Cohen, & McMurtry, 2016). Research suggest that optimists generally believe they can overcome any obstacle, appraise stressful issues more positively and use task-oriented coping strategies (Carver, Scheier, & Segerstrom, 2010; Chang, 1998;).

Adjustment to University Life

Transitioning to university can be difficult for some students because it is a time when individuals separate from their homes and families, interact with unfamiliar people and cultures, confront many new interpersonal, social, and academic demands, and feel confused related to emerging adulthood (Arnett, 2000; Benn, Harvey, Gilbert, & Irons, 2005). Research suggest that such a time is stressful for many students (Dyson & Renk, 2006; Pritchard, Wilson, & Yamnitz, 2007; Schilds, 2002). Furthermore, this process is not limited to the early period but continues throughout university life. Baker and Siryk (1984) defined *adaptation to university* as a multidimensional concept including four dimensions: academic, social, personal-emotional adjustment, and goal commitment-institutional attachment. Adjustment to university life has been considered as an important outcome and have consequently investigated a broad range of factors as its possible predictors (Crede & Niehorster, 2012), including motivational orientations (Baker, 2004), openness to new friendships and friendship quality (Buote et al., 2007), achievement motivation and self-efficacy (Elias, Noordin, & Mahyuddin, 2010), psychological hardiness (Sürücü & Bacanlı, 2010), and resilience (Kaba & Keklik, 2016; Rahat & İlhan, 2015).

Research has also provided evidence that optimism plays a vital role in adaptation to university life. Pritchard et al. (2007) found in a longitudinal study that optimism was the best predictor of physical and psychological outcomes in university adjustment. Perera and McIlveen (2014) also revealed the predictor role of optimism on the higher use of active coping and better psychological adjustment to college transition. Research suggest that optimistic undergraduates are less likely to see education as a source of stress (Krypel & Henderson-King, 2010). A recent study by Nurtila, Ketonen and Lonka (2015) showed that optimistic undergraduates reported the lowest task avoidance and highest competence in terms of achievement strategies. Cabras and Mondo (2018) found that optimism was positively correlated to task-oriented coping and life satisfaction of Italian freshmen. These findings suggest that the advantage of optimistic students in their adjustment to university life is a function of their characteristic effective coping style.

Cognitive flexibility is other construct that is closely associated with adjustment to university life. A high level of cognitive flexibility has been associated with a significant decrease in emotional stress using cognitive reappraisal and constructive thinking (Johnco, Wuthrich, & Rapee, 2014). These characteristics are effective in protecting the undergraduates from stress and negative experiences, both in academic adjustment and personal-social adjustment. Increased levels of cognitive flexibility are also associated with interpersonal communication competence (Martin & Rubin, 1995), more extroversion, more self-control, more openness for improvement (Bilgin, 2017), and a higher likelihood of using problem focused coping (Zhang, 2011). Cognitive flex-

ibility enables greater success in achieving desired goals (Tamir, 2009) and reduces the impact of negative experiences (Hirt, Devers, & McCrea 2008) by allowing an individual to generate ideas and consider alternative perspectives in order to adapt to changes in the environment (Johnson, 2016). In conjunction with this notion, cognitive flexibility correlated to the variables including problem-solving skills, study strategies, openness to change, academic performance, self-efficacy, and effective decision-making, which are closely associated with adjustment to university life (Bilgin, 2009; Lin, 2013; Gürbüz & Nartgün, 2018; Isen, 2000; Önen & Koçak, 2015). Bing (2011) also found, on a sample of 597 college students, that cognitive flexibility could predict school adaptation well. These findings suggest that adjustment seems to be related to the ability to deal with the academic, social, personal-emotional, and environmental challenges took in attending university.

The Current Study

Emerging adulthood is a critical period in lifelong development (Arnett, 2000). Undergraduate students confront with various life transitions and have to make decisions about their future and take on new roles and responsibilities. Therefore, this period of development, in which individuals experience a lot of change in their lives, is related to a high risk of mental health (Gore & Aseltine, 2003). Based on the theoretical support and explanations above, the prediction of the current study was that optimistic students would have high cognitive flexibility, deal with problems well, and adapt to changing environments easily and, as a result, would be more likely to be happy.

Method

Participants

A total of 386 undergraduates, 64% females and 36% males aged between 18 and 22 years, participated in the study. The participants of the current study comprised 175 freshmen, 125 sophomores, 66 juniors, and 20 seniors who were attending the Faculty of Education. A convenience sample of undergraduates from a small university in Turkey was used. The university is located in one of the touristic town on the southern coast of Turkey.

Procedure

Accordingly, the ethical principles, permission was received from the University Research Ethics Committee. All the students voluntarily participated in the research (not given extra credit or compensation) in classroom settings. The data were collected at the beginning of first term (fall) of the 2017–2018 academic year. The following measure were utilized in the study.

Instruments

Life Orientation Test

The test, assesses individuals' differences in dispositional optimism versus pessimism, includes 12 items with 4 items phrased optimistically, 4 items phrased pessimistically, and 4 items using as fillers (Scheier & Carver, 1985). A sample item of optimism is "In uncertain times, I usually expect the best," an example of pessimism is "I hardly ever expect things to go my way," and an example of filler is "It's important for me to keep busy." The scale has been reported to have adequate internal consistency (Cronbach's $\alpha = .76$) and 4-week retest reliability (.79) (Scheier & Carver, 1985). The scale is suitable for calculating a unidimensional score such as life orientation. High scores indicate high life orientation. Aydın and Tezer (1991) adapted the test to the Turkish culture, which is the version used in this study. The criterion validity of the test was assessed with Beck Depression Inventory in two groups, and the correlation coefficients were found to be $r = -.56$ and $r = -.45$, respectively. Cronbach's alpha coefficient was found to be .72 ($N = 150$), and the test-retest correlation was found to be .77 ($N = 97$) (Aydın & Tezer, 1991). In the current research, Cronbach's alpha coefficient was calculated as .80.

Cognitive Flexibility Inventory

The inventory was designed to measure three aspects of cognitive flexibility: "the tendency to perceive difficult situations as controllable; the ability to perceive multiple alternative explanations for life occurrences and human behavior; and the ability to generate multiple alternative solutions to difficult situations" (Dennis & Vander Wal, 2010, p. 241). The reliability and validity study of the scale in Turkish culture was carried out by Gülüm and Dağ (2012). The exploratory factor analysis showed that the two-factor structure of the scale has the same psychometric properties as its original form. Cronbach's alpha coefficients were found to be .89 for alternatives, .85 for control, and .90 for total. In addition, on a sample composed of 549 undergraduates, Doğan-Laçın (2015) found the values of the confirmatory factor analysis of the scale to be: $\chi^2 = 798.48$, $df = 169$, $RMSEA = .08$, $NFI = .95$, $CFI = .96$, $RMR = .08$. In the current study, the total score was obtained and used. Cronbach's alpha coefficient was calculated as .84.

Adjustment to University Life Scale

The scale was developed in order to evaluate the adjustment to university life in terms of personal, social, and academic dimensions (Aslan, 2015). In evaluating the psychometric properties of the scale, exploratory and confirmatory factor analyses were carried out with 488 undergraduate students (Aslan, 2015). The exploratory factor analysis revealed that the scale consisted of 60 items and 3 factors (personal,

social, academic) and explained 78.16 % of the total variance. The factor loadings for the items were between .33 and .77. A confirmatory factor analysis showed a three-factor structure with an acceptable overall fit: $\chi^2 = 5787.98$, $df = 1707$, $RMSEA = .08$, $NFI = .93$, $CFI = .93$, and $RMR = .07$. Cronbach's alpha coefficients were calculated as .92, .89, and .93, and test-retest coefficients were calculated as .82, .61, .84 respectively. Aslan (2015) reported that the scale's three-factor structure presented satisfactory validity and reliability results for Turkish university students. In the current study, the total score was used. Cronbach's alpha coefficient was calculated as .93.

Oxford Happiness Questionnaire Short Form

The questionnaire is an 8-item measure designed to evaluate the level of happiness (Hills & Argyle, 2002). Doğan and Akıncı-Çötök (2011) evaluated the psychometric properties of the OHQ-S in Turkish culture. The exploratory factor analysis revealed that the one-factor structure explained 39.74% of the total variance and that the factor loadings for the items were between .53 and .72. The confirmatory factor analysis showed a one-factor structure with a good overall fit: $\chi^2 = 36.05$, $df = 13$, $AGFI = .93$, $GFI = .97$, $RMSEA = .07$, $NFI = .92$, $CFI = .95$, and $RMR = .04$. Cronbach's alpha coefficient of the scale was calculated as .74, and the test-retest correlation was found as .85. It was reported that the scale's one-factor structure presented satisfactory psychometric properties in evaluating Turkish university students' happiness (Doğan & Akıncı-Çötök, 2011). In the current research, Cronbach's alpha coefficient was calculated as .78.

Statistical Analyses

Descriptive statistics, **Pearson's correlation method**, an approach based on Ordinary Least Squares Regression, and Bootstrapping were used in the analyses of the data. Mahalanobis distance values were calculated in order to determine outliers and 4 outliers were deleted as they exceeded the chi-square critical value. The analyses were conducted with 382 observations. The values of kurtosis and skewness were calculated to prove normal univariate distribution. As the values of skewness and kurtosis showed acceptable ranges in the region of -1 to +1 (optimism: skewness -.34, kurtosis: .21; cognitive flexibility: skewness .13, kurtosis: -.31; adjustment to university life: skewness .13, kurtosis .33; happiness: skewness -.19, kurtosis .00), it was concluded that the scores did not show a significant deviation from the normal distribution (Tabachnick & Fidell, 2013).

A multiple mediation model which involves "simultaneous mediation by multiple variables" (Preacher & Hayes, 2008, p. 880), was also used in the present study. Hayes (2009) state "if zero is not between the lower and upper bound,, then the analyst can claim that the indirect effect is not zero with ci% confidence." (p. 412). In addition, a contrast test was used to determine specific indirect of the vari-

ables and stronger mediators in the model. The Bootstrapping analyses of the study were conducted by "Multiple Mediation Model 6" through PROCESS Macro 3 using IBM SPSS 24.0 (Hayes, 2017). A P-value of .05 is considered on the borderline of statistical significance.

Results

Descriptives and Correlations

Pearson's correlation coefficients were utilized to determine the relationships among the variables. The means, standard deviations, and correlations are presented in Table 1.

Table 1. Descriptive statistics and Pearson correlation coefficients related to research variables

Variables	Mean	Mean	Kurtosis	Skewness	1	2	3	4
1. Optimism	26.06	5.89	.22	-.34	---			
2. Cognitive Flexibility	88.87	11.38	-.31	.13	.40**	---		
3. Adjustment	214.87	28.47	.33	.13	.37**	.31**	---	
4. Happiness	22.90	4.88	.00	-.19	.65**	.37**	.48**	---

N = 382, ** $p < .01$

Table 1 shows that optimism is positively correlated with cognitive flexibility, adjustment to university life, and happiness. Cognitive flexibility is positively correlated with adjustment to university life and happiness. There is also a positive correlation between adjustment to university life and happiness.

Mediation Model Analyses

The findings for the serial mediating roles of cognitive flexibility and adjustment to university life in the relationship between optimism and happiness are presented in Figure 2.

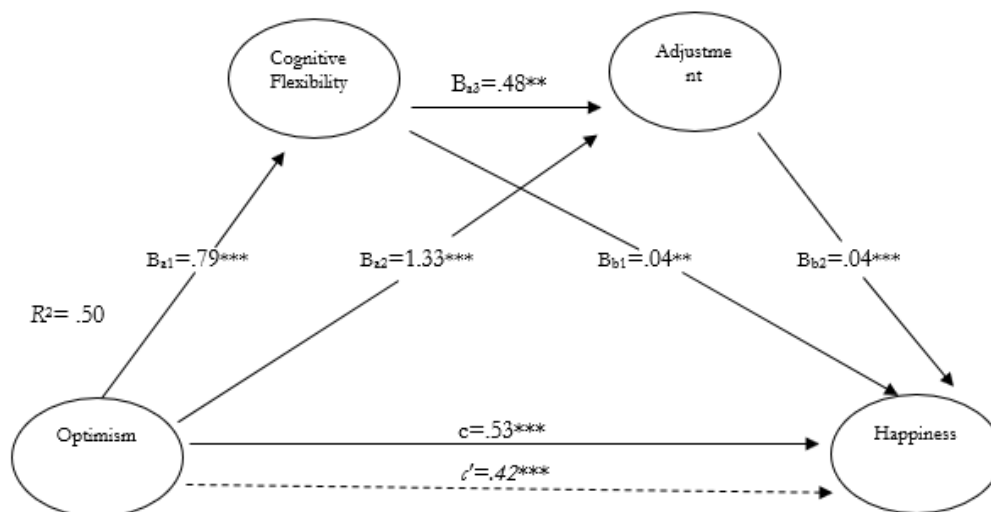


Figure 2. The Serial Mediation of Cognitive Flexibility and Adjustment to University Life in the Relationship between Optimism and Happiness.

As presented in Figure 2, the total effect of optimism on happiness is statistically significant ($c = .53$, $SE = .03$, $t = 16.46$, $p < .001$) (step 1). The direct effects of optimism on cognitive flexibility ($B = .79$, $SE = .09$, $t = 8.75$, $p < .001$) and adjustment to university life ($B = 1.33$, $SE = .24$, $t = 5.37$, $p < .001$) are statistically significant, as well as the direct effect of cognitive flexibility (the first mediating variable) on adjustment to university life (the second mediating variable) ($B = .48$, $SE = .12$, $t = 3.81$, $p < .001$) (step 2). In addition, the direct effects of cognitive flexibility ($B = .04$, $SE = .01$, $t = 2.35$, $p < .01$) and adjustment to university life ($B = .04$, $SE = .00$, $t = 6.46$, $p < .001$) on happiness is also significant (step 3). When optimism and two mediating variables were entered simultaneously into the equation (step 4), the signifi-

cant relationship between optimism and happiness decreased, but the significance level did not change ($c' = .42$, $SE = .03$, $t = 12.22$, $p < .001$). These results support the mediational hypothesis. The model is significant ($F_{(5-370)}$, $p < .001$) and explained approximately 50% of the variance in happiness.

Indirect Effects of Optimism on Happiness through Cognitive Flexibility and Adjustment to University Life

The comparison of the direct and specific indirect effects of undergraduates' optimism on happiness through cognitive flexibility is presented in Table 2.

The indirect effects were tested using bootstrapping with 10,000 bootstrap samples. The estimates were taken within 95% confidence intervals, and the bias corrected and accelerated results are presented in Table 2. Because of the unequal distribution of men and women in the sample, gender was used as a covariate in the analyses. The total indirect effect (the difference between the total and indirect effects /c-c') of optimism through cognitive flexibility and adjustment on happiness were statistically significant (point estimate =

.1110 and 95% BCa CI [.0724, .1540]). In addition, the mediators in the hypothesized model were examined individually. The results revealed that the mediation of cognitive flexibility (point estimate = .0329 and 95% BCa CI [.0060, .0656]), the mediation of adjustment to university life (point estimate = .0608 and 95% BCa CI [.0325, .0920]), and the multiple mediation of cognitive flexibility and adjustment to university life (point estimate = .0174 and 95% BCa CI [.0066, .0316]) were also statistically significant.

Table 2. The comparison of direct and specific indirect effects of optimism on happiness through cognitive flexibility and adjustment to university life

Effects	Product of coefficients		Bootstrapping	
	Point Estimate	SE	Lower	Upper
Total Indirect Effects	.1110	.0207	.0724	.1540
Opt → Cog. Flex. → Happ.	.0329	.0153	.0060	.0656
Opt → Adjust. → Happ.	.0608	.0153	.0325	.0920
Opt → Cog. Flex. → Adjust. → Happ.	.0174	.0063	.0066	.0316
Contrasts				
Model 1 versus Model 2	-.0279	.0238	-.0731	.0202
Model 1 versus Model 3	.0155	.0160	-.0140	.0487
Model 2 versus Model 3	.0434	.0163	.0133	.0765

corrected and accelerated 10,000 bootstrap samples, Model 1= Optimism – Cognitive Flexibility – Happiness; Model 2= Optimism – Adjustment to University Life – Happiness; Model 3= Optimism – Cognitive Flexibility – Adjustment to University Life – Happiness.

Finally, the strength of the individual indirect effects against each other were compared. In the first comparison, model 1 (mediation of cognitive flexibility) was not statistically different from model 2 (mediation of adjustment). In the second comparison, model 1 (mediation of cognitive flexibility) was not statistically different from model 3 (serial multiple mediation of cognitive flexibility and adjustment). Based on a 95% BCa confidence interval, within the statistically significant comparison, model 2 (mediation of adjustment) was stronger than model 3 (serial multiple mediation of cognitive flexibility and adjustment). The indirect effect via adjustment to university life is greater than the effect via the two other indirect effects.

Discussion

The findings showed that the mediation of cognitive flexibility and adjustment to university life were statistically significant in the model. Also, the mediational hypothesized model had significant levels and explained approximately 50% of the variance in happiness. The findings of the model comparisons also revealed that the mediation of adjustment to university life was stronger than the others.

Relationship between optimism and happiness

Consistent with prior research, optimism was found to be associated with happiness in this study. High optimistic individuals are considered to have better moods, to be stable, and also to be in better physical health (Peterson, 2000). Due to the fact that optimism promotes a healthy lifestyle, adaptive and constructive reactions, action-oriented problem solving, and flexible moods, it has important implications for

both mental well-being and physical well-being (Conversano et al., 2010). The findings of the current research confirm these earlier studies in literature. For example, Pacheco and Kamble (2016) found that optimism was positively correlated to positive affect, happiness, and life satisfaction and negatively correlated to negative affect and depression. Marrero, Carballeira, and González (2014) reported that optimism is a relevant personality trait to improve the subjective well-being of undergraduates. Yue, Hao, and Goldman (2010) also found that optimism was negatively correlated with psychological distress symptoms in undergraduates. The advantage of well-being for optimistic people is considered to be a function of their characteristic coping style. Research has provided evidence that optimistic students generally deal with stress in a more active way than pessimistic students (Ji & Zhang, 2011). Shapira and Mongrain (2010) conducted an experimental study in which the effectiveness of an optimism exercise was compared with a control group in a large non-clinical Canadian sample. Regardless of initial happiness levels, study findings showed that the participants in the optimism intervention group were happier than those control group. These studies confirm the hypothesized model of the current study in which optimism is the predictor variable. Seligman's view on optimism (1990) also explains why optimists are happy. According to "learned optimism" approach of Seligman (1990), optimists have characteristic explanatory style about the causes of the events. Optimists provide good events to lighten every field of their lives. Furthermore, the other reason why optimistic people are happy is that they have generally active coping strategies to come up with the stressful situations. For example, Hanssen et al. (2014) confirmed that motivational coping served to mediate the relationship between optimism and all indices of well-being.

Mediating roles of cognitive flexibility and adjustment to university life

In the current research, optimism was found to be associated with cognitive flexibility. The association between optimism and cognitive flexibility is considered to be a function of positive outcomes stemming from optimism. This positive personality trait promotes cognitive flexibility, suggesting that thinking more about positive outcomes enhances individuals' abilities to perceive difficult situations as controllable and to generate multiple alternative solutions to difficult situations which in turn allows them to be flexible and open to new alternatives.

Consistent with prior research, optimism was also found to be associated with adjustment to university life in this study. Optimistic individuals have a disposition to hold positive expectations for the future and maintain their efforts to reach their personal goals. Optimism also has a cognitive construct that relates to motivation: optimists use effort, whereas pessimists disengage from effort (Carver & Scheier, 2014). Because of their positive, goal-oriented view, their level of motivation is high (Ben-Zur, 2003). These characteristics are effective in academic, personal, and social adjustment to university life.

The present results also reveal that cognitive flexibility and adjustment to university life, the mediators in the current research, were found to be related. This finding confirms earlier studies in the literature. For example, on a sample of 597 colleague students, Bing (2011) found a positive correlation between cognitive flexibility and school adaptation. The transition to university is a time when individuals separate from their homes and families, interact with unfamiliar people and cultures, and are confronted with many new interpersonal, social, and academic demands (Benn et al., 2005). People with cognitive flexibility believe they can succeed in communication in different situations, they are enthusiastic to try new ways of communication, and they adapt to meet their needs when they encounter unusual situations (Martin & Anderson, 1998). Cognitive flexibility is associated with using various thinking strategies and mental frameworks. Individuals with cognitive flexibility have the ability to investigate the environment to identify changes as they occur and create multiple strategies to prepare for whatever may develop (Gurvis & Calarco, 2007). Based on these explanations, it can be concluded that cognitively flexible undergraduates view themselves as competent to cope with new interpersonal, social, and academic demands in adjustment to university life.

In the current research, the predictor role of cognitive flexibility on happiness was found to be statistically significant. Cognitive flexibility is essential for individuals to successfully challenge and change maladaptive thoughts with adaptive thinking. Individuals with high cognitive flexibility are better equipped to consider and employ various coping strategies in order to resolve situations and reduce distress (Johnson, 2016). The findings of a similar study by Asıcı and

İkiz (2015) confirmed that the level of cognitive flexibility is associated with greater happiness. Similar with optimistic people, the advantage of happiness in cognitively flexible people may be considered a function of their characteristic coping style. Fu and Chow (2017) investigated the effect of earthquake experiences on psychological well-being and the potential moderating role of cognitive flexibility on the relationship between earthquake experiences and psychological well-being on adolescents. The authors reported that adolescents with high levels of cognitive flexibility may better tolerate uncertainty in life, think in constructive ways about the earthquake experience, and deal with challenges in an effective way and that all these processes promote their psychological well-being.

Findings from the model comparisons revealed that the indirect effect on adjustment to university life is greater than the effect of the two other mediators. Individual differences in adjustment to university life seem to be important. Even though some students experience this transition as a challenge for their personal development, this process is stressful for many students (Dyson & Renk, 2006; Shields, 2001). Individual characteristics such as personality traits, resilience, openness to new friendship, and self-efficacy have been shown play a significant role in adjustment to university life (Buote et al., 2007; Elias et al., 2010; Halamandris & Power, 1996; Kaba & Keklik, 2016 ; Rahat & İlhan, 2015). The findings of the current research indicate that individual differences in optimism have significant predicting roles for adjustment to university and the happiness of undergraduates. This finding confirms earlier studies in the literature. With the help of adaptive direction of objectives and using constructive coping strategies, optimistic people are expected to be more successful, especially in difficult situations and complex tasks (Conversano et al., 2010). Optimists perceive things in the best possible light and work harder and more efficiently (Carver et al., 2010). These characteristics have the effect of reducing their stress and negative experiences. Research also suggest that optimism predicts not only better physical outcomes but also better psychological outcomes in university adjustment (Pritchard et al., 2007). The advantages of adjustment and well-being in optimistic people are considered a function of their characteristic coping style. In a study by Herrmann (2007), active coping strategies of the optimists mediated the relationship between optimism and adjustment to college life. Researchers have stated that such coping abilities should, in turn, lead to more positive physical and mental health outcomes (Koesten, Schrodt, & Ford 2009). According to Gabrys, Tabri, Anisman and Matheson (2018) in the context of a stressful situation, cognitive flexibility provides generating multiple coping strategies and adjusting flexibly according to changing stressor demands. A respectable literature implies that people who have positive expectations about the future see difficulties as obstacles to overcome, so they behave in more adaptive ways in adverse conditions than pessimistic people (Carver et al., 2010). Both cognitive flexibility and optimism play an important role in

an individual's ability to cope with circumstances that are deemed to be challenging.

Finally, it could be concluded that optimistic students may use cognitive alternatives (cognitive flexibility) stemming from their positive expectations or cognitively flexible students have motivations and alternatives to control the course of their actions in most situations; thus they may adjust better to changed or new task demands and situations and might be happier.

Limitations

The most important limitation of the research is the cross-sectional design as the causal relationships cannot be concluded. Future research will therefore need to involve experimental studies in order to investigate causal relationships. Another limitation is about the participants as they

were chosen through the convenience sampling method. Undergraduates from different regions would have increased the generalizability of the research findings.

Implications

The present research provides a comprehension about the happiness of undergraduates by considering the relationships between optimism, cognitive flexibility, and adjustment to university life. As well as the findings of this study may be used for preventive counseling and guidance programs, it has also practical implications for happiness promotion suggesting that interventions focused on optimism and cognitive flexibility will enhance both adjustment to university life and happiness of undergraduates. Therefore, the study has the potential to provide a view for further research and practice.

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