Dispositional Optimism Mediate the Effect of Emotional Disorders On Self-Reported Psychological State: The Case of Çukurova University Students

Eğilimsel İyimserlik Duygusal Bozuklukların Psikolojik Durum Üzerindeki Etkisine Aracılık Eder: Çukurova Üniversitesi Öğrencileri Örneği

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ABSTRACT

This study examines whether dispositional optimism mediates the effects of emotional disorders (anxiety, depression) on self-reported current psychological state. For this purpose, indirect effects of anxiety and depression through dispositional optimism is tested for statistical significance. For preliminary results, a multivariate regression model including current psychological state as dependent variable and anxiety, depression and dispositional optimism as predictors was run. Anxiety and dispositional optimisim significantly predicted current psychological state. Depression subscale was not a significant predictor. Hierarchical regression analysis and structural equation modeling was performed to determine the mediating role of dispositional optimism. Hierarchical regression analysis results show that dispositional optimism significantly predicts psychological state beyond anxiety ($\Delta F(1,851)=64.21$, $\Delta R^2=0.067$, $p<.01$). The maximum likelihood results showed that indirect effect of anxiety were significant through dispositional optimism. That is, dispositional optimism significantly mediated the effects of anxiety ($z=-6.51$, $p<.01$) on psychological state. Hierarchical regression analysis indicate that the mediation is partial. Consequently, dispositional optimism has the ability to buffer negative effects of anxiety on psychological status.

Keywords: Psychology, Optimism, Anxiety, Structural Equation, Çukurova University.

ÖZ

Bu çalışma, duygusal bozuklukların (anksiyete, depresyon) kişinin bildirdiği mevcut psikolojik durum üzerindeki etkilerine yatkınlıksal iyimserliğin aracılık edip etmediğini incelemektedir. Bu amaçla, kaygı ve depresyonun eğilimsel iyimserlik yoluyla dolaylı etkileri istatistiksel anlamlılık açısından test edilmiştir. Ön sonuçlar için, bağımlı değişken olarak mevcut psikolojik durumu ve tahmin ediciler olarak kaygı, depresyon ve eğilimsel iyimserliği içeren çok değişkenli bir regresyon modeli koşulmuştur. Kaygı ve eğilimsel iyimserlik, psikolojik durumu anlamlı bir şekilde tahmin etmiştir. Hastane anksiyete ve depresyon ölçeğinin depresyon faktörü, regresyon analizinde anlamlı bir yordayıcı değildi. Eğilimsel iyimserliğin aracı rolünü incelemek için hiyerarşik regresyon analizi ve yapısal denklem modellemesi kullanılmıştır. Hiyerarşik regresyon analizi sonuçları, eğilimsel iyimserliğin kaygının ötesinde psikolojik durumu anlamlı bir şekilde yordadığını göstermektedir ($\Delta F(1,851)=64.21$, $\Delta R^2=0.067$, $p<.01$). Maksimum olabilirlik sonuçları, kaygının dolaylı etkisinin, eğilimsel iyimserlik yoluyla anlamlı olduğunu göstermiştir. Yani, eğilimsel iyimserlik, kaygının ($z=-6.51$, $p<.01$) psikolojik durum üzerindeki etkilerine anlamlı bir şekilde aracılık etmiştir. Hiyerarşik regresyon analizi, aracılığın kısmi olduğunu göstermektedir. Sonuç olarak, eğilimsel iyimserlik, kaygının mevcut psikolojik durum üzerindeki olumsuz etkilerini azaltma yeteneğine sahiptir.

Anahtar Kelimeler: Psikoloji, İyimserlik, Kaygı, Yapısal Denklem, Yüksek Öğrenim.

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1. Introduction

Psychological status of university students are influenced by extremely high volatility of emotions and moods in their social and academic life issues as they pursue academic achievement with positive future expectations. For example, university students become more anxious during final examinations week (Dewberry & Richardson, 1990). Their psycholocial states depending on their performance and personality traits can change rapidly. However, dispositional optimism can contribute to lower the effects of anxiety on current psychological state (CPS). For self-reported assessments, a theory of optimism is developed by Scheier & Carver (1985) in which optimism should have positive future expectancies in a wide range of behavioral domains based on day-to-day experiences over a period of time. The important role of optimism on achieving psychological well-being state by meeting basic psychological needs in the educational environment was emphasized (Sheldon and Elliot, 1999).

Anxiety is widely experienced emotion due to life stressors and essential construct of all human behavior (Barlow, 2000). It is the most pervasive and serious issue for college students (Gao, Ping & Liu, 2020) and in particular, it may have a global effect on optimism, i.e. reduce optimism toward a broad range of judgments (Dewberry & Richardson, 1990). Thus, students' psychological states can be affected by their personality traits and life stressors which are associated with psychological distress (stress, anxiety, depression). Regardless of scale of psychological distress, optimism was positively related to psychological well-being and negatively related to psychological distress (Gustems-Carnicer, Calderón & Santacana, 2017, p.25; Saeed et al., 2020, p.1; Yüksel & Bahadır-Yılmaz, 2019, p.1; Liu, Shono & Kitamura, 2009, p.1). College students with psychological distress also showed lower levels optimism and higher levels of pessimism (Tuckwiller & Dardick, 2018, p.32).

Personality traits of university and college students demonstrate significant relations with PWB. For example, relation of optimisim with PWB. Previous literature findings of positive correlations between optimism and PWB include 0.16 (Honmore & Jadhav 2015, p.181), 0.38-0.59 (Augusto-Landa, Pulido-Martos, & Lopez-Zafra, 2010, p.468), 0.26-0.62 (Gustems-Carnicer et al. 2017, p.24), 0.23-0.54 (Zaheer & Khan, 2022, p.60), 0.325 (Parveen, Maqbool & Khan 2016, p.16), 0.45(Souri & Hasanirad 2011, p.1542) whereas significant negative correlations between anxiety and optimisim are found as -0.18 to -0.63 (Siddique, LaSalle-Ricci, Glass et al., 2006, p.673), -0.234 (Chen, Su, Zhang & Yan, 2021, p.5), -0.452 (Singh & Jha, 2013, p.226). Significant negative correlations between depression and optimism are also found as -0.14 (Chen et al., 2021, p.5), -0.40 (Hardin & Leong, 2005, p.30).

This study aims to examine mediation effect of dispositional optimisim over self-reported psychological states of Çukurova University students. Revised Life Orientation Test LOTR (Scheier, Carver & Bridges, 1994) for dispositional optimisim, and Hospital Anxiety and Depression Scale HADS (Zigmond and Snaith, 1983) are used to measure indirect effects of HADS on CPS. Anxiety and depression can also be considered as emotional or psychological disorders. Optimism is expected to contribute to psychological states of students.

2. Literature Review

Kapıkıran (2012, p.337), Daukantaite & Zukauskiene (2012, p.10), Uğurlu (2013, p.501), Jiang et al. (2014, p.4), Rezaei & Khosroshahi (2018, p.156) used hierarchical regression analysis and structural equation modelling to examine mediation and/or moderation effects.

Lee, Kim, Shim & Park (2017, p.179) used hospital anxiety and depression scale for pre-and pro-operative clinical assessment of patients.

Chang, Sanna & Yang (2003, p.1196), Chang & Sanna (2001), Bayrami et al. (2012, p. 307) investigated the effects of optimisim and pessimism over psychological adjustments.

Scheier & Carver (1985, p.225) and Jiang et al. (2014, p.3) in methodology performed factorial assessments for dimensional structures of LOT or LOT-R

Chang (1998) used hierarchical regression analyses to show that dispositional optimism was a moderator between perceived stress and psychological well-being.

Zhang et al. (2014) found optimism as a partial mediator over the relationship between affectivities and subjective well-being.

Ionescu (2018) examined the role of optimism on meeting basic psychological needs such as competence and its impact on well being of 251 students at University of Bucharest. The author used linear hierarchical regression and mediation analysis to show that optimistic students achieve greater towards their goals and tend to satisfy their basic psychological needs which also reflects on thier psychological well-being.

Pu, Hou & Ma (2017) examined the mediating role of dispositional optimism on the effect of self-efficacy on depression based on a survey of 535 undergraduates from two universities. The authors used SEM to show that dispositional optimism was a partial mediator.
Yu et al. (2015) used SEM to show that dispositional optimism was partial mediator of the relation between rumination and anxiety. The study was based on a survey of 448 Chinese undergraduate students. A positive correlation was found between rumination and anxiety, and a negative correlation between dispositional optimism and anxiety. Significant indirect effect was found using bootstrapping method.

3. Method
3.1. Survey Procedure

A social survey was applied to 855 Çukurova University students in Adana between 18-28 January 2019. All survey data are in ordinal level. A trained group of students collected data using Google Drive. The students who collected the data were present to answer the questions to be asked by the participants.

The sample of 855 students consisted of 487 women (57%) and 368 men (43%). 81 percent of the participants were in the 18-24 age category, 18 percent in the 25-31 age category, 0.6 percent in the 32-38 age category and 0.22 percent in the 39+ age category. Average age 1.2 categories (sd 0.43). 466 (54.5%) of the participants were from Adana city center.

3.2. Measures

The scales used for dependent and independent variables are explained below. The dependent variable of this study is current psychological state. LOT-R and HADS factors are predictor variables.

3.2.1. Psychological State

Self-reported current psychological state can be used for psychological well-being (PWB). It consists of one item: "I feel bad psychologically". This item is rated on a 5-point scale from 0="always" to 4="never". Table 1 shows that 20% of the participant students often or more feel bad psychologically.

Table 1. Frequency distribution of variables

CPS	Frequency	Percent
Always	30	3.51
Very often	34	3.98
Often	107	12.51
Sometimes	376	43.98
Never	308	36.02

3.2.2. The Revised Life Orientation Test LOT-R

Revised Life Orientation Test LOT-R (Scheier et al., 1994) consists of 10-item optimism and pessimism scales. Three items assess optimism (O), three pessimism (P) and remaining four items are filling items (R):

O1: "usually expect the best in unknown times"
R1: "easy to relax"
P1: " things will go wrong for me, once happens"
O2   "always optimistic about future"
R2   "enjoy friends a lot"
R3   " important to keep busy"
P2   " very rarely expect things to go my way"
R4   " not very easy to get upset"
P3   " hardly count on good things"
O3   "expect more good than bad"

Participants reported to what extent they agreed with each item. The questionaire is the five-point Likert scale from never=0 to always=4. Cronbach's alpha based on standardized items was calculated as 0.71 for LOTR.

3.2.3. Hospital Anxiety and Depression Scale

Hospital Anxiety and Depression Scale HADS (Zigmond and Snaith, 1983) has 14 items which anxiety and depression subscales shares equally. Participants responded how they have felt over the past week. For these variables " not at all", "occasionally", "a lot of time" and "most of the time" options or similar are presented.

Anxiety items:

"tense or wound up",
"frightened as if awful will happen",
"worrying thoughts, but feel relaxed",
"frightened as if butterflies in the stomach",
"feeling restless",
"get sudden feelings of panic"

Depression items:

"enjoy the things as before",
"laugh and see funny sides",
"cheerful",
"slowed down",
"lost interest in appearance",
"looking forward with enjoyment",
"enjoy a good book, radio or TV "

3.3. Data Analysis

Preliminary data analysis indicated that raw scores of all subscales (depression, anxiety, optimism, pessimism, filler) were aproximately normally distributed based on histogram and density plots. However, skewness and kurtosis test of raw data indicated that only for depression probabilities of skewness and kurtosis were greater than 0.05. After running regression model, residuals are predicted and normality of residual distribution is checked using skewness and kurtosis normality test. Results indicated that probability of chi^2 was less than 0.05, showing that residuals were not normally distributed. Histogram and density of residuals plot showed a negatively skewed distribution.

For homoscedasticity of residuals, White test is used. After running regression equation, residuals are predicted and the squared residuals are generated. Subsequently, squares and cross products of explanatory variables were generated as new auxiliary variables, and the squared residual is regressed into these auxiliary variables together with the original variables. Test statistic $N*R^2$ is estimated as 77.70 and compared with $Chi^2(k-1, .05)$ for k=12 to test the null hypothesis: residuals are homoscedastic. $Chi^2(k-1, .05)$ is calculated from $(R^2/1)/((1-R^2)/n-2)$ as 84.57 which is greater than 77.70 and hence homoscedasticity was not rejected.

To test the residuals for autocorrelation, casenum is generated and a time series is created using tsset. The Ljung-Box Q statistic is used to test for autocorrelation. Correlogram of residuals indicated no significant autocorrelation of residuals.

Probabilities of Q (significance) all were greater than 0.05.

Multicollinearity issue is checked using tolerance values (1/variance inflation factor (vif)) which are found to be greater than 0.10. The VIF of pessimism, optimism, depression and anxiety were found between 1.03 and 1.36.

Factor analysis and Maximum Likelihood (ML) with oblimin rotation with no number of factors specified generated a two-factor solution which was accepted against the absolute test of model fit by ML method.

4. Results

Table 2 shows mean, standard deviation and scores of the scales. Mean of depression is slightly higher than that of anxiety whereas the mean of optimism is significantly higher than that of pessimism.

Table 2. Descriptions of variables

Variables	Mean	sd	min	max
CPS	3.05	0.979	0	4
HADS	28.89	4.477	16	41
HADS(Anxiety)	14.20	2.693	3	21
HADS(Depression)	14.69	2.643	6	22
LOTR	23.72	5.971	8	40
LOTR(Optimism)	7.55	2.803	0	12
LOTR(Pessimism)	4.94	2.485	0	12

4.1. Description of LOTR

Table 3 describes response and relative frequencies, means, standard deviations for the items in the LOTR, corrected item total correlations and the questionnaire's internal consistency. The mean score for total LOTR scale was 23.72 (sd=6), for optimism 7.55 (sd=2.8), for pessimism 4.94 (sd=2.5). LOT-R Cronbach's alpha for standardized items was 0.713.

Table 3. LOT-R Descriptive Statistics and Reliability Analysis

Variables	Mean	sd	α	r
O1	2.74	1.12	.653	.600
R	2.13	1.07	.653	.619
P1	1.57	1.06	.727	.146
O2	2.31	1.13	.643	.655
R	2.72	1.12	.664	.541
R	2.36	1.15	.692	.374
P2	1.86	1.12	.757	-.053
R	1.90	1.14	.713	.248
P3	1.51	1.09	.715	.233
O3	2.51	1.27	.678	.451

4.2. Factorial Assessment

To analyze the factorial structure, the ML with Oblimin was used. The Kaiser-Meyer-Olkin=0.821 and Bartlett's Test of Sphericity ($\chi^2 = 2420$, p<.01) show goodness of fit. Factor analysis shows a two factor solution that explains 53.60% of variance. The first factor was generated by the optimism and filler items. It explains 35% of the variance with factor loadings between 0.46 and 0.80, and Cronbach α is 0.82. The second factor which is generated by the pessimism items explains 18.7% of the variance with factor loadings between 0.711 and 0.805, and Cronbach α is 0.64. In subsequent regression analysis, factor 1 is taken as optimisim and factor 2 as pessimisim.

4.3. Bivariate Correlations

Table 5 shows means, standard deviations and pairwise correlations of predictor variables with PWB based on total scale scores. LOT-R is stronger correlate (.322) than HADS (-0.136).

Table 5. Bivariate correlations of predictors with CPS

	1	**2**	**3**	**4**	**5**	**6**	**7**
1.CPS	1.000						
2.HADS (Depression)	-0.020	1.000					
3.HADS (Anxiety)	-0.207*	0.408*	1.000				
4.HADS	-0.136*	-0.836*	0.842*	1.000			
5.LOTR	0.322*	0.044	-0.338*	-0.177*	1.000		
6.LOTR (Optimism)	0.213*	0.005	-0.306*	-0.181*	0.868*	1.000	
7.LOTR (Pessimism)	0.277*	-0.14*	0.020	-0.07**	-0.372*	-0.042	1.000
Mean (sd)	3.1(0.98)	14.7(2.64)	14.2(2.7)	28.9(4.5)	23.7(5.97)	7.6(2.8)	4.9(2.5)

*:p < 0.01, **:p<0.05

4.4. Multivariate Regression Analysis

Multiple regression analysis was conducted to determine the relation between emotional disorders, dispositional optimisim and CPS. LOT-R and HADS as predictors and CPS as dependent variable were included in the multiple regression model. According to the results of regression analysis shown in Table 6, HADS and LOT-R together explain 11% of the total change in PWB. On the other hand, optimism, pessimism and anxiety significantly predicted CPS, but depression did not. All explain 13.86% of the total variation in CPS.

Table 6. Multiple Regression Analysis of HADS and LOT-R

Predictors	β	Robust s.e.	t
		CPS	
HADS	-0.018	.008	-2.31**
LOT-R	0.050	.006	8.54*
	$F(2, 852)=43.19$ $R^2=0.110$		
HADS(Anxiety)	-.057	.015	-3.85*
HADS(Depression)	.002	.015	.16
LOTR(Optimism)	.054	.012	4.29*
LOTR(Pessimism)	-.105	.015	-7.15*
	$F(4, 850)=28.60$ $R^2=0.139$		

*:$p < 0.01$, **:$p<0.05$

4.5. Dispositional Optimism As Predictor

Hierarchical regression analysis was used to determine the contribution of dispositional optimism to emotional disorders. Psychological state was entered as the dependent variable. Anxiety and depression were entered as potential predictors in the first block and optimism in the second block.

Hierarchical regression analysis results in Table 7 show that optimism, beyond other characteristics, significantly predicts CPS ($F(1,851)=64.21$, $\Delta R^2=.067$, $p<.01$). This shows the additional predictive value of optimism in predicting CPS in the sample used. Optimism explained an additional 6.70% change in CPS beyond the contribution of predictor variables. $p<0.01$ shows statistically significant improvement in the second model compared to the first model. When the contribution of optimism is analyzed, it is seen that optimism enhances CPS as anxiety levels gets higher. In particular, levels of CPS decreases less from -0.086 to -0.043.

Table 7. Hierarchical Regression Analysis

	CPS			
	Model 1		Model2	
Predictors	β	t	β	t
Anxiety	-.0866	-6.51*	-.043	-3.09*
Depression	.0287	2.11**	.006	0.45
LOT-R			.046	8.01*
F(df)	21.34(2, 852)		36.68(3, 851)	
F(df) change		64.21(1, 851)		
R^2	0.048		0.115	
R^2 change		0.067		
p		.000		

*:$p <.01$, **:$p<.05$

4.6. Dispositional Optimism as Mediator

Correlations showed that dispositional optimism is the strongest correlate of CPS. According to hierarchical regression results, the fact that optimism significantly predicts CPS beyond emotional disorders provides sufficient evidence that optimism may be a mediating variable between emotional disorders and CPS.

To examine the mediating role of optimism, the significance of the indirect effects of anxiety and depression variables was tested using structural equation modeling (SEM). Stata 14 was used to estimate models with ML method. The results show that the indirect effect of only anxiety is significant through optimism. That is, optimism significantly mediated the effects of anxiety ($z = -6.51$, $p < .01$) over CPS.

Hierarchical regression analyzes were conducted to examine whether this mediation was partial or full. In each regression, a HADS factor is entered in the second block after optimism is entered in the first block of the regression equation. The second model showed that anxiety ($\Delta R^2 = .072$, $p < .01$) was still significant in predicting CPS, which indicates that optimism partially mediates the relation between anxiety and CPS.
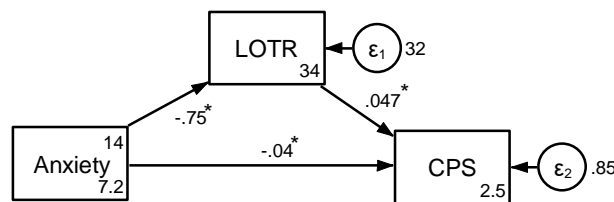

Figure 1. Mediation model for dispositional optimisim. *:<.01

Structural models in Figure 1 show the direct and indirect effects of anxiety on CPS. The coefficients and significance levels that explain CPS are indicated on the three paths from anxiety to CPS. Figure 1 indicates significant indirect effects of anxiety ($p < .01$) over CPS. Dispositional optimism is the mediator variable for the relationship between anxiety and CPS. For example, the direct effect of anxiety on CPS is -0.04 and the indirect effect is -0.75 (0.047) = - 0.035.

5. Conclusion

This article investigated mediating effects of dispositional optimisim over the relation between emotional disorders and psychological states for a sample of Çukurova University students. As expected, the results of pairwise correlation analysis indicated positive significant relation of optimism with CPS and significant negative relation of anxiety with CPS. This finding was in line with Yin, Sun & Wang (2019) and Shah & Deshpande (2022). The latter was in line with Yu et al. (2015).

Total raw scale scores were used in hierarchical regression and SEM analysis. With total scores in mediation models, all paths are found to be significant ($p < .01$) and direct effect was greater than indirect effect. Anxiety and dispositional optimisim significantly

predicted current psychological state of the students. Depression subscale of hospital anxiety was not a significant predictor in the regression analysis. Structural equation modeling is used to examine the mediating role of dispositional optimism. Hierarchical regression analysis results showed that dispositional optimism significantly predicted psychological state beyond anxiety ($\Delta F(1,850)=70.35$, $\Delta R^2=.053$, $p<.01$). The maximum likelihood results showed that indirect effect of anxiety were significant through dispositional optimism. That is, dispositional optimism significantly mediated the effects of anxiety ($z=-6.51$, $p<.01$) on psychological state. Hierarchical regression analysis indicated that the indirect effect of anxiety via dispositional optimism was significant. Dispositional optimism partially mediated the relation between anxiety and CPS. Consequently, dispositional optimism has the ability to buffer negative effects of anxiety on psychological status.

Despite the limitations of the cross-sectional studies, this study is expected to contribute to the literature on psychological well-being of students. Considering that the psychological states of students are heterogeneous and dramatically change depending on social and academic life issues, more studies are needed to compare the outcomes.

In order to lessen emotional disorders in persuing academic achievement and beyond, university administrative policies are needed toward students to sustain their positive future expectations.

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