



Cognitive flexibility and psychological hardiness: examining the mediating role of positive humor styles and happiness in teachers

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Abstract

In this study, the mediating role of positive humor styles and happiness in the relationship between cognitive flexibility and psychological hardiness was investigated. The participants in the study, which was conducted based on a correlational design, one of the quantitative research methods, consisted of 613 volunteer teachers (322 women, 291 men) employed in various schools and institutions affiliated to the Ministry of National Education in Turkey. The study data were obtained through the Cognitive Flexibility Scale, the Psychological Hardiness Scale, the Humor Styles Questionnaire, and the Oxford Happiness Questionnaire Short-Form. Correlation analysis, structural equation modeling and bootstrapping were used for the analysis of the data. The results obtained from the mediation test showed that cognitive flexibility positively predicted psychological hardiness, and that positive humor styles and happiness were partial mediating variables in this relationship. The findings obtained in the research were discussed in the light of the related literature and recommendations were presented.

Keywords Cognitive flexibility · Psychological hardiness · Positive humor styles · Happiness · Teacher

Introduction

The teaching profession, which is one of the basic building blocks of the education system, is an occupational group exposed to stress and burnout (Chan, 2003). A large percentage of teachers consider the teaching profession to be stressful (Zhao et al., 2022). This situation negatively affects teachers' performance and job satisfaction (Capone & Petrillo, 2020). It is possible to carry out educational activities efficiently by coping effectively with the sources of stress arising from the teaching profession and by practicing the teaching profession happily. It is known that psychological hardiness is effective in reducing stress and burnout (Chan, 2003) and enables employees to be more successful (Maddi et al., 2006). Therefore, psychological hardiness is

regarded as an important force in reducing the stress and burnout experienced by teachers (Chan, 2003), and it is predicted that increasing psychological hardiness in teachers will have a positive effect in reducing stress and professional burnout, as well as on school climate.

Psychological hardiness

Humans, who are innately capable of adapting to their environment, strive to adapt to every environment and region they enter. In this way, they have been able to learn to survive against all natural obstacles and have become capable of coping with difficulties in all kinds of geographical regions from the poles to the deserts. However, in certain cases, events may occur that humans cannot cope with and that upset their balance. Deadly diseases, wars, the death of a loved one, natural disasters, and the negative consequences of job and financial losses can unbalance the individual and push the limits of the individual's ability to cope. In such cases, if individuals are not sufficiently equipped to cope, they feel weak, their inner tension increases, their anxiety level rises, their emotional balance deteriorates, and they may even experience physical discomfort (Diener & Seligman, 2002). However, there are such people who, despite all these negative living conditions, do not run out

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of energy even in the face of major disasters, and who, on the contrary, grow a little stronger after each stressful event (Bartone et al., 2022). To describe these individuals, the concept of “hardiness”, which means resilience, toughness, or resistance, is used in the literature (Funk, 1992; Lambert & Lambert, 1999). Diener and Seligman (2002) defined such individuals as having the power to recuperate, and stated that they have problem-solving skills, actively contribute to social changes, are disposed to improve themselves, are open to changes, are able to interpret bad experiences and make the best of them, have the ability to establish positive relationships, and are optimistic about the future.

When the definitions of psychological hardiness are examined, it is emphasized that there is an important life threat and that in the face of this threat, the individual must possess two important characteristics, namely staying resistant and readapting (Bartone et al., 2022). In particular, it is seen that the COVID-19 pandemic process, which has been affecting the whole world recently (Moroń et al., 2021) and whose effects are still ongoing, poses an important life threat. Moreover, it is observed that the pandemic has caused significant disruptions in education and has had negative effects on teachers and students (Harris & Jones, 2020). In this period, when intense stress, anxiety, and physical and mental difficulties are being experienced due to the effect of the pandemic (Moroń et al., 2021), it is considered important to investigate the factors affecting psychological hardiness and to determine the factors that will increase teachers’ psychological hardiness levels. In fact, there are findings in previous studies showing that psychological hardiness has a positive effect on school climate (Sezgin, 2009) and increases cooperation and communication among teachers (Chan, 2003; Sezgin, 2009). Furthermore, it is stated that individuals who are psychologically resilient are open to changes in their environment and strive to learn about these changes (Bartone et al., 2022). In this respect, rather than being a simple structure, psychological hardiness consists of a complex structural system that develops early in life and is reasonably stable over time, though amenable to change under certain conditions (Bartone et al., 2022). Indeed, previous studies have shown that psychological hardiness not may remain constant in the individual (Luthar et al., 2000) and that just as it may increase over time, it may also decrease (Funk, 1992). Therefore, examining the factors that affect teachers’ levels of psychological hardiness can make important contributions to the literature.

Cognitive flexibility

Another coping method that can reduce the effect of stress on individuals is cognitive flexibility (Dennis & Vander Wal, 2010; Erickson & Feldstein, 2007). Cognitive flexibility, which enables programming and coordination in processes related to

perception, memory and movement (Ionescu, 2012), is a quality that enables the ability to cope with stress and increases functionality in the face of complex and changing situations (Curran & Andersen, 2017). Individuals with a high level of cognitive flexibility have been defined as individuals who are successful in interpersonal relationships, possess developed problem-solving skills, can adapt to new situations, and feel competent in different situations (Dennis & Vander Wal, 2010; Kolburan et al., 2019; Moore et al., 2017). For this reason, like psychological hardiness, cognitive flexibility is a quality that helps to reduce stress when coping with difficulties. Indeed, when we look at the literature, it can be seen that there is a significant relationship between cognitive flexibility and psychological hardiness (Vaziri et al., 2021), and that cognitive flexibility plays an important role in explaining psychological hardiness (Parsons et al., 2016). Since cognitive flexibility makes it easier to find new solutions by seeing alternatives in unexpected situations, it contributes to recovery by generating more solutions in the face of difficulties (Çelikkaleli, 2014; Deveney & Deldin, 2006). Similarly, psychological hardiness also contributes to maintaining a high level of ability to cope with unexpected, challenging situations (Bartone et al., 2022; Funk, 1992; Lambert & Lambert, 1999; Vaziri et al., 2021).

Cognitive flexibility also occupies an important place in education and training activities. For reasons such as the diversity of problems that arise due to increasing technological developments, and the effects of the modern age on students’ learning styles, teachers are obliged to keep pace with the age and generation. Therefore, cognitive flexibility is a quality that teachers should not only possess, but also foster in their students. Based on all these data, the effect of cognitive flexibility is considered to be an important factor in the development of psychological hardiness in teachers.

The mediating role of positive humor styles

As a significant predictor of psychological hardiness (Kennison, 2022) and an ability to cope with negative emotions, sense of humor functions as a means of experiencing happiness and more positive emotions (Yaprak et al., 2018). It has been seen that humor is a natural facilitating force used in difficulties arising both from the individual him/herself and from environmental factors (Gladding, 1995), and is effective in coping with the burnout and stress brought about by life (Chan, 2003). It is emphasized that humor is an effective strategy for coping with negative emotions and tensions (Abel, 2002; Erickson & Feldstein, 2007). Moreover, it is stated that humor has a positive effect on mental and physical health (Erickson & Feldstein, 2007), strengthens interpersonal relationships (Cheng & Wang, 2015) and is effective in reducing tension (Ruch, 1998). It has been observed that humor, which has an important role in education and training activities, increases teachers’ motivation, job satisfaction and performance (Latifi et al., 2022).

When we look at the studies on humor, it can be seen that they are related to cognitive schemas (Cheng & Wangs, 2015; Dai et al., 2017), that the effective use of humor facilitates adaptation in the individual (Martin et al., 2003), and that even in cases where a problem is complex, the use of humor creates a change in the individual's perspective on the event (Dennis & Vander Wal, 2010; Johnson et al., 2010). Considering the formation process of cognitive flexibility, it has been observed that sources of stress decrease as the cognitive process is recognized and dysfunctional thoughts are replaced by healthier thoughts (Corey, 2013).

In determining teachers' humor styles, the classification made by Martin et al. (2003) has been taken as the basis. Here, humor styles are divided into four classes, of which two are positive (affiliative, self-enhancing), and two are negative (aggressive, self-defeating). Self-enhancing humor is a type of humor that is active in reducing negative emotions because individuals also take into account the needs of others alongside their own personal characteristics. Affiliative humor is a style of humor developed by individuals' respect for others together with awareness of their own needs. An aggressive humor style is a form of humor that the individual uses to meet his/her own need for superiority without showing respect for others, and that does not conform to social norms. Self-defeating humor, on the other hand, is the state of making fun of oneself in order to entertain others by disregarding one's own needs (Martin et al., 2003). Considering the structure of the teaching profession, it is thought that teachers' positive humor styles may be stronger because they are continually in the community. Indeed, studies have shown that teachers' positive humor styles are stronger and that they regard themselves as being more disposed to affiliative humor styles (Alisherovna & Dildora, 2022). Cognitive flexibility and psychological hardiness are also thought to be associated with positive humor styles rather than with negative humor styles.

Positive friendship relations and the social environment are also regarded as one of the protective factors of psychological hardiness (Earvolino-Ramirez, 2007). The more healthy relationships an individual can establish with his/her environment, the greater psychological hardiness he/she will have. It is known that humor has a positive effect on mutual relations, strengthens social ties, positively contributes to maintaining communication (Erickson & Feldstein, 2007), and improves the ability to stay resilient and to cope in difficult situations. In this way, humor contributes to the development of skills such as establishing healthy relationships and developing positive emotions (Martin et al., 2003). From this point of view, it is foreseen that a positive humor style may be related to psychological hardiness and that cognitive flexibility may increase psychological hardiness through the mediation of positive humor.

The mediating role of happiness

One of the most studied positive psychology concepts in recent times is that of happiness (Kennison, 2022; Yaprak et al., 2018). Happiness, which is regarded as one of the most important determinants of mental health, is associated with concepts such as subjective well-being, positive emotions (De Almeida & Mattos, 2022), life satisfaction, and quality of life (Büyükçolpan & Ozdemir, 2022). It has been concluded that happiness, which was previously thought to be only an emotion, is a concept that can be learned and developed cognitively and affectively (Biswas-Diener et al., 2004). The satisfaction derived by the individual from life constitutes the cognitive dimension of happiness, while experiencing positive and negative situations forms the affective dimension (Diener, 2009). Happiness can also be defined as a person's positive evaluation of their quality of life in general (Büyükçolpan & Ozdemir, 2022).

In the academic, professional and social life of the individual, being successful and psychologically healthy is in parallel with the increase in his/her level of happiness. It is known that psychological hardiness brings about positive harmony together with happiness by reversing negative situations (Kennison, 2022). Thus, it is thought that if teachers are psychologically resilient, this will bring about academic improvement as well as happiness. It is stated that individuals who quickly and easily adapt to changes and possess coping skills are healthier and happier (De Almeida & Mattos, 2022). This is also related to the concept of cognitive flexibility, which is the ability to react quickly and appropriately to changes (Ionescu, 2012; Vaziri et al., 2021). Based on these inferences, the hypothesis that cognitive flexibility can predict psychological hardiness through happiness can be developed.

With regard to the teaching profession, the concept of psychological hardiness is important for effectively coping with stressful experiences and maintaining a happy life. In particular, skills such as adapting to new situations, finding quick and correct solutions to problems, using humor effectively, and positive communication are extremely important for the teaching profession. Since the teaching profession is a profession that requires communication, it is also a profession that is open to socialization. It is thought that teachers' active use of these communication channels (with students, parents and colleagues) can also have a positive effect on their cognitive flexibility, positive humor styles and happiness levels. A high level of adaptability enables teachers to perform actively and to be flexible. From this point of view, it can be seen that together with psychological hardiness, the concepts of cognitive flexibility, positive humor styles and happiness are each important variables for the teaching profession.

Consequently, in this study, it is considered important to determine the factors that can be an alternative to reducing the professional burnout and stress experienced by teachers and that will explain psychological hardiness. In this context, it is deemed worth investigating the idea that cognitive flexibility is an important force in explaining psychological hardiness, and that positive humor styles and happiness have a predictive effect in this relationship. Although there are studies in the literature that examine the variables of cognitive flexibility, psychological hardiness, humor and happiness separately or in pairs, the fact that no study examining these concepts together could be found reveals the gap in this area. In this study, the aim is to fill this gap in the field.

Research model

In this study, a correlational survey model was used to reveal the direct predictive power of cognitive flexibility, positive humor styles and happiness on psychological hardiness. Creswell (2011) defined the correlational survey model as a model that aims to determine the existence or degree of covariance between two or more variables. In structural models, predictive relationships between internal and external variables and latent structures in factor analyses are tested together (Creswell, 2011). In this study, the relationships between the aforementioned variables were examined, and then the hypothetical model presented for the indirect relationships between psychological hardiness and cognitive flexibility through positive humor styles and happiness was tested. In line with the aim stated above, the proposed model for the indirect relationships between cognitive flexibility and psychological hardiness through positive humor styles and happiness is shown in Fig. 1.

The following hypotheses were tested with the model shown in Fig. 1:

H₁: Cognitive flexibility positively predicts psychological hardiness.

H₂: Cognitive flexibility positively predicts psychological hardiness through positive humor styles.

H₃: Cognitive flexibility positively predicts psychological hardiness through happiness.

H₄: Positive humor styles and happiness play a mediating role in the relationship between cognitive flexibility and psychological hardiness.

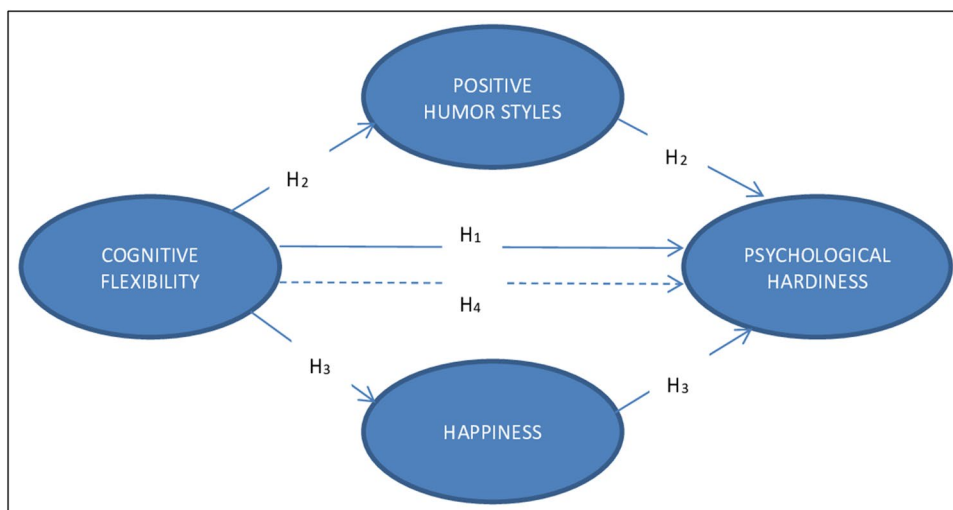
Methods

Participants

Before beginning the data collection process related to the study, the necessary ethics committee approval was obtained from the Social and Human Sciences Publication Ethics Committee of Van Yüzüncü Yıl University with the decision number 2020/15–54, dated 30/12/2020.

The universe of the study consists of teachers employed in institutions affiliated to the Ministry of National Education in 2021. Among the 613 participants recruited through convenience sampling, 52.2% (n: 322) were female and 47.5% (n:291) were male. The age range of the study group varied between 23 and 63, and their mean age was found to be 30.98 (SD: 6.35). Among the participants, 56.6% (n:347) stated that they were single and 43.4% (n:266) reported that they were married. When the participants' branches are examined, it can be seen that classroom teaching (17.1%, n:105), special education teaching (14.2%, n:87), preschool teaching (11.4%, n:70) and Turkish teaching (9.3%, n:57) are prominent. The majority of the participants worked in secondary schools (37.8%, n:232) and high schools (22%, n:135). When the length of service in the profession is

Fig. 1 Theoretical Research Model



examined, it can be seen that the mean length of service was 6.22 years (SD:6.10).

Data collection tools

Psychological hardiness scale Developed by Işık (2016), the scale was designed as a 5-point Likert-type scale with 21 items. Following the exploratory and confirmatory factor analysis performed to determine the construct validity of the scale, it was determined that the scale consisted of 3 sub-dimensions. These sub-dimensions were named as “Commitment, Control, Challenge”. The Cronbach alpha reliability coefficient for the whole scale was found to be 0.76, and the internal consistency coefficient was calculated as 0.80 (Işık, 2016). In the current study, following the confirmatory factor analysis performed to determine the construct validity of the Psychological Hardiness Scale, the 3 sub-dimensions were confirmed, and it was seen that the model fit values provided good fit (X^2/df : 2.03, RMSEA: 0.05, SRMR: 0.03, GFI: 0.98, AGFI: 0.94, CFI: 0.96, IFI: 0.96). Moreover, as a result of the reliability analysis performed for the whole scale, it was found that the Cronbach alpha coefficient was 0.79 and that the item-total correlations ranged from 0.36 to 0.74.

Cognitive flexibility scale The Turkish adaptation of the scale developed by Martin and Rubin (1995) was made by Çelikkaleli (2014). The scale was designed as a 6-point Likert-type scale with a single dimension and 12 items. In the Turkish adaptation studies, the internal consistency coefficient was calculated as 0.80 and the test–retest reliability coefficient was calculated as 0.83 (Çelikkaleli, 2014). In the current study, following the confirmatory factor analysis performed to determine the construct validity of the Cognitive Flexibility Scale, the single-factor structure of the scale was confirmed and it was seen that the model fit values demonstrated good fit (X^2/df : 4.62, RMSEA: 0.07, SRMR: 0.05, GFI: 0.93, AGFI: 0.98, CFI: 0.86, IFI: 0.86). Moreover, as a result of the reliability analysis performed for the current study, it was found that the Cronbach alpha coefficient was 0.77 and that the item-total correlations ranged from 0.34 to 0.73.

Humor styles questionnaire This questionnaire, which was developed by Martin et al. (2003), was adapted into Turkish by Yerlikaya (2003). It consists of four subscales, of which two are positive (Self-Enhancing and Affiliative) and two are negative (Self-Defeating and Aggressive). The questionnaire was created as a 7-point Likert-type scale with a total of 32 items, and each subscale consists of 8 items. While the entire scale can be used together, the subscales can also be used separately. The internal consistency coefficients of the Affiliative Humor and Self-Enhancing Humor subscales were found to be 0.80 and 0.81, respectively. In addition, the test–retest reliability coefficients of the Affiliative Humor

and Self-Enhancing Humor subscales were found to be 0.85 and 0.81, respectively (Yerlikaya, 2003). As a result of the reliability analysis performed for the Self-Enhancing and Affiliative Humor subscales, which are the sub-dimensions of the questionnaire that were used in the current study, the Cronbach alpha coefficients were calculated as 0.85 and 0.80, respectively. It was seen that the model fit provided good values (X^2/df : 4.29, RMSEA: 0.07, SRMR: 0.06, GFI: 0.92, AGFI: 0.89, CFI: 0.90, IFI: 0.90), while the item-total correlations were found to be between 0.36 and 0.64.

Oxford happiness questionnaire short-form This questionnaire, which was developed by Hills and Argyle (2002), was adapted into Turkish by Doğan and Çötök (2011). During the Turkish adaptation studies for the Oxford Happiness Questionnaire Short-Form, which consists of 8 items and is a 5-point Likert-type scale, in the item analyses, the 4th item was removed from the scale due to its insufficient representative power. In the studies conducted by Doğan and Çötök (2011), the Cronbach alpha internal consistency coefficient of the scale was calculated as 0.74, while the reliability coefficient obtained with the test–retest method was calculated as 0.85. In the current study, as a result of the confirmatory factor analysis performed to determine the construct validity of the scale, the single-factor structure of the scale was confirmed, and the model fit values demonstrated good fit (X^2/df : 3.04, RMSEA: 0.05, SRMR: 0.03, GFI: 0.98, AGFI: 0.96, CFI: 0.98, IFI: 0.98). Moreover, as a result of the reliability analysis carried out for the whole scale, it was found that the Cronbach alpha coefficient was 0.81 and that the item-total correlations ranged from 0.35 to 0.58.

Data analysis

The data were analyzed using the SPSS 23.0 (Statistical Package for the Social Sciences) and SPSS Amos 24.0 (Analysis of Moment Structures) software packages. In the data analysis, first of all, the frequency values of the data set were checked. Then, the skewness and kurtosis values of all the scales were examined. After this, the minimum, maximum, mean and standard deviation descriptive statistical values were examined. The reliability, collinearity and covariance values of all measurement instruments used in the study were examined. The correlations between the variables required to establish the model were examined with Pearson product-moment correlation coefficients. After the measurement models of the measurement instruments were confirmed with confirmatory factor analysis, the hypothetical model was tested with the measurement model, and the measurement values were found to be acceptable. In the last part of the study, the proposed model was tested with structural equation modeling and bootstrapping, and the relevant results were evaluated.

Results

The descriptive statistics and correlation relationships for the participants’ psychological hardiness, cognitive flexibility, positive humor styles and happiness variables are given in Table 1. In structural modeling, one of the first assumptions to be considered is to ensure that the variables are normally distributed (Kline, 2016). The two most important elements of normality are the skewness and kurtosis coefficients. In normal distributions, the skewness coefficient is expected to be within the range of ± 1 and the kurtosis value to be close to zero (Hair et al., 2013). As can be seen in Table 1, since the skewness and kurtosis values of all scales and sub-dimensions of these scales were within the range of ± 1 , it was accepted that the data were normally distributed.

Another assumption of structural modeling is that there should be significant relationships between dependent, independent and mediating variables (Baron & Kenny, 1986; Kline, 2016). When the findings in Table 1 are examined, it can be seen that all variables have positive and significant relationships with each other. According to these findings, it was determined that there were significant positive correlations for cognitive flexibility with psychological hardiness ($r=0.53$; $p<0.01$), positive humor styles ($r=0.35$; $p<0.01$) and happiness ($r=0.51$; $p<0.01$); for psychological hardiness with positive humor styles ($r=0.38$; $p<0.01$) and happiness ($r=0.50$; $p<0.01$), and finally, for positive humor styles with happiness ($r=0.42$; $p<0.01$).

Before testing the mediation model proposed in the study, the relationship between the variables was examined in response to the question of whether cognitive flexibility, which is the independent variable of the study, significantly predicts psychological hardiness, which is the dependent variable. In the last stage of the study, the mediating role of positive humor styles and happiness in the relationship between cognitive flexibility and psychological hardiness was tested. The results of this analysis are shown in Fig. 2.

Examining the findings shown in Fig. 2, cognitive flexibility was found to directly predict psychological hardiness ($\beta=0.71$, $p<0.01$), positive humor styles ($\beta=0.53$, $p<0.01$) and happiness ($\beta=0.67$, $p<0.01$) positively and significantly. Moreover, according to the findings in Fig. 2, positive humor styles ($\beta=0.21$, $p<0.01$) and happiness ($\beta=0.27$, $p<0.01$) were also found to directly predict psychological hardiness positively and significantly.

When the R^2 values shown in Fig. 2 are examined, it can be seen that 25% of the total change in positive humor styles is explained by cognitive flexibility, 46% of the total change in happiness is explained by cognitive flexibility, and 59% of the total change in psychological hardiness is explained by cognitive flexibility, positive humor styles and happiness.

When the mediating variables were included in the analysis in order to determine the mediating roles of the mediating variables in the model, the regression coefficient between cognitive flexibility and psychological hardiness decreased from 0.71 to 0.43 ($p<0.01$). In the relationship between cognitive flexibility and psychological hardiness, since the regression coefficient decreased significantly with the inclusion of the mediating variables in the model (Baron & Kenney, 1986), it was determined that positive humor styles and happiness had a mediating role in this relationship. The model fit values for Fig. 2 are given in Table 2.

As can be seen in Table 2, which shows the fit values tested in the measurement model of the study, the chi-square/degree of freedom (X^2/df) value was 2.84, the root mean square error of approximation (RMSEA) value was 0.055, the standardized root mean square residual (SRMR) value was 0.04, the goodness-of-fit index (GFI) value was 0.91, the adjusted goodness-of-fit (AGFI) value was 0.89, the comparative fit index (CFI) value was 0.90, and the incremental fit index (IFI) value was 0.90.

To determine whether the indirect effects of partial mediation detected in the model were significant, the

Table 1 Correlations between the variables of the theoretical model

	1	2	3	4	5	6	7	8	9
1. Psychological Hardiness	1								
2. Commitment	0.84**	1							
3. Control	0.81**	0.56**	1						
4. Challenge	0.82**	0.57**	0.46**	1					
5. Cognitive Flexibility	0.53**	0.37**	0.39**	0.54**	1				
6. Positive Humor	0.38**	0.25**	0.29**	0.39**	0.35**	1			
7. Self-Enhancing Humor	0.38**	0.27**	0.27**	0.38**	0.30**	0.84**	1		
8. Affiliative Humor	0.26**	0.14**	0.22**	0.27**	0.29**	0.85**	0.44**	1	
9. Happiness	0.50**	0.37**	0.42**	0.46**	0.51**	0.42**	0.43**	0.28**	1
\bar{X}	62.13	20.36	19.72	22.04	57.04	77.18	38.5	38.68	62.13
SD	7.27	2.76	2.90	3.07	6.49	12.32	7.40	7.10	4.52
Skewness	-0.15	-0.05	0.08	-0.02	-0.14	-0.42	-0.40	-0.59	-0.25
Kurtosis	0.04	-0.12	0.47	-0.01	-0.10	-0.19	-0.23	-0.20	-0.07

$N=613$, ** $p<0.01$ * $p<0.05$

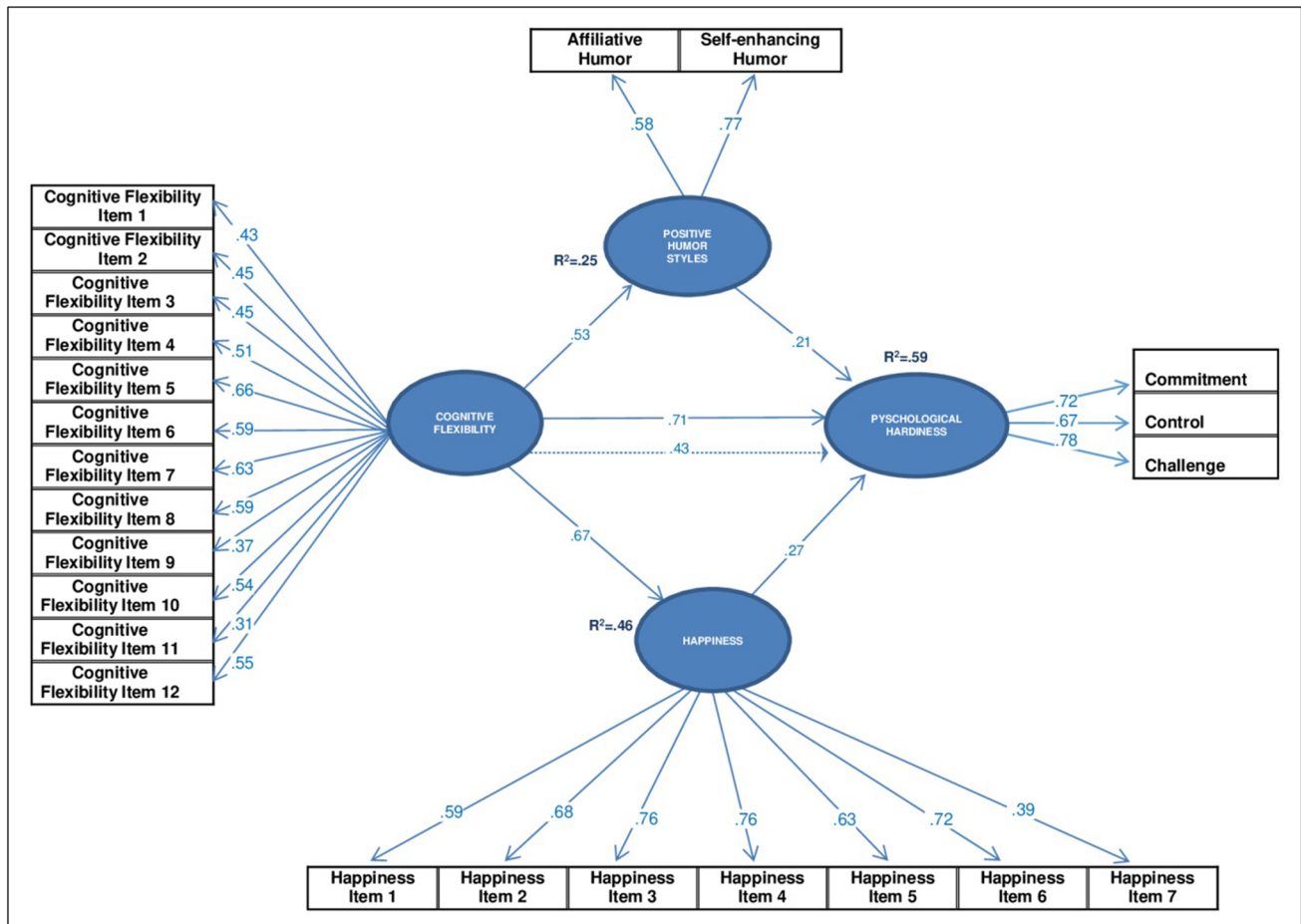


Fig. 2 Analysis model for the mediating role of positive humor styles and happiness in the relationship between cognitive flexibility and psychological hardiness. ** $p < 0.01$, * $p < 0.05$, N:613

Table 2 Model fit values for the structural model

Good Fit	Acceptable Fit	Value	Degree of Fit
$\chi^2/df \leq 3$	$\chi^2/df \leq 5$	2.84	Good fit
$RMSEA \leq 0.05$	$RMSEA \leq 0.08$	0.055	Acceptable fit
$0 < SRMR \leq 0.05$	$0 < SRMR \leq 0.08$	0.04	Good fit
$0.90 \leq GFI$	$0.85 \leq GFI$	0.91	Good fit
$0.90 \leq AGFI$	$0.89 \leq AGFI \leq 0.85$	0.89	Acceptable fit
$0.90 \leq CFI$	$0.85 \leq CFI$	0.90	Good fit
$0.95 \leq IFI$	$0.94 \leq IFI \leq 0.90$	0.90	Good fit

Schreiber et al. (2006), Tabachnick & Fidell, (2013)

bootstrapping process was performed with 5,000 resamples, and the bootstrap results are given in Table 3.

As seen in Table 3, the indirect effect of positive humor styles between cognitive flexibility and psychological hardiness was significant (bootstrap coefficient = 0.26, 95% confidence interval = 0.126 and 0.346). Similarly, it was concluded that the indirect effect of happiness between

cognitive flexibility and psychological hardiness was significant (bootstrap coefficient = 0.31, 95% confidence interval = 0.201 and 0.412). The bootstrap results were found to be statistically significant as their lower and upper limits did not include the null value in the 95% confidence interval. Based on all these findings, it can be stated that positive humor styles and happiness have a partial mediating role in the relationship between cognitive flexibility and psychological hardiness.

Discussion

In this study, the mediating role of positive humor styles and happiness in the relationship between cognitive flexibility and psychological hardiness was investigated. Before testing the relevant model, the relationships between the variables were examined with Pearson product-moment correlation, and positive significant relationships were found between all variables. Then, the measurement model was tested and the

Table 3 Bootstrap results for the mediation of positive humor styles and happiness between cognitive flexibility and psychological hardiness

Indirect Effects	Bootstrap Coefficient	SE	At 95% Confidence Interval		R ²	F
			Lower Limit	Upper Limit		
CF → PH → PsH	0.26	0.029	0.126	0.346	0.59	73.76**
CF → Hap → PsH	0.31	0.038	0.201	0.412		

** $p < 0.01$, * $p < 0.05$, SE: Standard Error, CF: Cognitive Flexibility, PH: Positive Humor, PsH: Psychological Hardiness, Hap: Happiness

model fit values were found to be within the acceptable limits. In the last step of the study, it was seen that as a result of the mediation test, positive humor styles and happiness acted as partial mediating variables in the relationship between cognitive flexibility and psychological hardiness. In other words, cognitive flexibility was seen to explain psychological hardiness both directly, and indirectly through positive humor styles and happiness. In this part of the study, the created model is discussed within the framework of the literature and recommendations are presented.

Effect of cognitive flexibility on psychological hardiness

It was first concluded that cognitive flexibility directly and significantly predicts psychological hardiness, which is the first hypothesis of the study. Throughout the studies in the literature that examine the relationship between cognitive flexibility and psychological hardiness, significant relationships have been found between cognitive flexibility and psychological hardiness (Vaziri et al., 2021).

The concept of psychological hardiness and its effect on humans is gaining in importance day by day. It has been stated that in the modern world, physical strength is no longer sufficient, and that in order to be happy, individuals also need to be psychologically strong (Işık, 2016). Besides this, cognitive flexibility is also considered to be one of the important components of being a healthy individual (Ionescu, 2012). Individuals possessing cognitive flexibility can see alternative options by adapting to new and different situations (Deveney & Deldin, 2006; Martin & Anderson, 1998; Martin & Rubin, 1995). Thus, it can be said that they cope more easily in the face of difficulties and adapt better with new solutions.

Among the external protective factors of psychological hardiness are problem-solving skills, social competence, positive peer support and secure relationships (Olsson et al., 2003). Similarly, it is known that individuals possessing cognitive flexibility have advanced communication skills, are assertive and can adapt easily (Martin & Anderson, 1998). The internal protective factors of psychological hardiness include characteristics such as optimism, self-esteem and internal locus of control (Friborg et al., 2005). Many of these traits are also associated with cognitive flexibility. Therefore,

it can be said that cognitive flexibility has a positive effect in increasing psychological hardiness.

The mediating role of positive humor styles

As the second hypothesis of the study, it was determined that cognitive flexibility predicts psychological hardiness through positive humor styles. The fact that inconsistencies occurring in daily life are the subject of humor is also related to the cognitive dimension of humor (Dai et al., 2017). Considering the cognitive elements of humor, it is foreseen that cognitive flexibility will predict humor positively. Moreover, the fact that there are studies in the literature showing that humor positively predicts psychological hardiness (Yaprak et al., 2018) is consistent with the research findings. Therefore, the fact that cognitive flexibility explains psychological hardiness via positive humor confirms this prediction.

Individuals with a strong sense of humor have the ability to see the funny side of events (Ruch, 1998). In this way, these individuals can also see the good situation within bad situations (Işık, 2016). Since psychological hardiness makes the individual strong and resistant in the face of difficulties, it can be stated that there is a significant relationship between humor and psychological hardiness. According to Earvolino-Ramirez (2007), humor as a protective factor has a positive effect on psychological hardiness. Yaprak et al. (2018) evaluate the individual's sense of humor as a defense mechanism against the difficulties he/she encounters in life, and are of the opinion that this has a positive effect on psychological hardiness.

In organizational environments, especially positive humor styles contribute to the creation of a safe and warm climate by tempering the atmosphere and reducing anxiety and fears in relations among employees. The use of humor in a positive way, that is, in a way that shows respect to oneself and others and that improves relationships, is regarded as a self-actualized human trait. Since the use of positive humor has a corrective effect on negative events, it can also alleviate the effects of stress (Abel, 2002). Just as positive humor styles can have a soothing and corrective effect, negative humor styles can have a negative effect on communication and relationships. It is very important for teachers to acquire positive humor styles in terms of both organizational life and the development of the teaching process (Wu et al., 2022), since during the process of

students' acquisition of desired behaviors, teachers are in communication not only with students in the classroom, but also with school administrators and families. Positive humor styles are also effective on the teacher's social life, relationships with colleagues, quality of life, and outlook on life (Alisherovna & Dildora, 2022; Latifi et al., 2022).

The prediction of humor by cognitive flexibility is supported by various studies in the field of neurology. It has been concluded that the parts of the individual's memory that process complex data are activated through the use of humor, and that these complex structures are recorded in the brain in a more permanent way (Dai et al., 2017). Moreover, in studies conducted on humor, it has been observed that smiling contributes to creativity and increased attention (Johnson et al., 2010). Since cognitive flexibility develops through the use of attention, memory and perception processes (Dennis & Vander Wal, 2010), it can be said that the use of humor contributes to this process.

Cognitive flexibility plays an important role in social relations. Previous studies have shown that cognitive flexibility is significantly correlated with adaptability and commitment in mutual relationships (Martin & Rubin, 1995). It is known that affiliative humor, which is one of the sub-dimensions of positive humor styles, also improves social relations (Martin et al., 2003) and is positively associated with positive emotions such as being cheerful, being outgoing, self-esteem and relational satisfaction (Diener & Seligman, 2002). Therefore, it is expected that individuals who have an affiliative humor style will be compatible in their social relationships and also possess cognitive flexibility. Moreover, just as with cognitive flexibility, it is known that individuals who have positive humor styles make better use of positive coping skills (Abel, 2002). Thus, the positive and significant relationship found between cognitive flexibility and positive humor styles shows that the hypothesis put forward in this direction is confirmed. Self-enhancing humor, which is another positive sub-dimension of humor styles, has been found to be negatively associated with negative situations such as anxiety and sadness (Yerlikaya, 2003), and positively associated with positive emotions like psychological well-being and self-esteem (Martin et al., 2003). Similarly, there is a negative correlation between cognitive flexibility and anxiety in the literature (Denevey & Deldin, 2006).

The fact that humor is a protective feature against stressful situations is supported by previous studies (Abel, 2002; Kolburan et al., 2019). By reducing the tension in daily life, the use of humor to facilitate interpersonal relationships with a tolerance-based and non-aggressive attitude (Erickson & Feldstein, 2007; Ruch, 1998) ensures positive relationships through extroversion and positive emotions. The fact that humor and sense of humor are positively correlated with healthy and effective coping methods (Erickson & Feldstein, 2007) and psychological health (Martin et al., 2003),

and negatively correlated with depression, fear and anxiety (Abel, 2002) can be said to support the research findings. In the light of these findings, it can be stated that cognitive flexibility predicts psychological hardiness both directly, and indirectly through positive humor styles.

The mediating role of happiness

According to the third hypothesis of the study, it was observed that cognitive flexibility explains psychological hardiness through happiness. Since the individual can generate different solutions with cognitive flexibility (Curran & Andersen, 2017), he/she also has the fighting spirit to meet his/her needs. Considering the fact that by obtaining more satisfaction from life, the individual whose needs are met is happier (Büyükoçlan & Ozdemir, 2022; Capone & Petrillo, 2020), it is expected that individuals who have cognitive flexibility will derive satisfaction from life and be happy. Previous studies showing that cognitive flexibility increases happiness (Demirtaş, 2020; Yildiz & Eldeleklioglu, 2021) and that happiness increases psychological hardiness (Yaprak et al., 2018) support the research findings.

Happiness, which grounds the individual's affective and cognitive evaluations of his/her life, is defined as experiencing fewer negative emotions and more positive emotions, and deriving high satisfaction from life in general (Diener, 2009). Psychological hardiness, on the other hand, makes it easier to cope with negative events and the resulting negative emotions that will be experienced. This strengthens the affective and cognitive evaluations associated with happiness. In this context, psychological hardiness makes it easier to overcome the bad effects of negative situations and also increases positive adaptation, which includes social and behavioral adaptation skills (Friborg et al., 2005). Thus, it can be said that happiness is a factor that maintains and increases psychological hardiness.

The presence of protective factors for psychological hardiness ensures that the individual continues to be happy by preventing the occurrence of difficulties in life. Indeed, it has been observed that happy individuals can easily overcome the bad effects of an event that occurs by activating their protective factors against possible risk factors (Diener & Seligman, 2002). Maddi et al. (2006) regards protective and risk factors as two opposing concepts and states that increasing psychological hardiness also leads to happiness in the individual. In previous studies on psychological hardiness, it has been stated that individuals with psychological hardiness are more optimistic, have advanced problem-solving skills, and are self-confident individuals (Parsons et al., 2016). Many of these characteristics also play a role in individuals' happiness. As a result, it can be said that happy individuals are more psychologically resilient and that in this context, cognitive flexibility explains psychological hardiness via happiness.

The mediating role of positive humor styles and happiness

According to the final hypothesis of the study, positive humor styles and happiness have a partial mediating role in the relationship between cognitive flexibility and psychological hardiness. In other words, it has been observed that increasing cognitive flexibility contributes to the development of psychological hardiness both directly, and indirectly through positive humor styles and happiness. No study has been found in the literature that examines the relationships between these four variables together. However, in the literature review, findings supporting this network of relationships were found. Since cognitive flexibility makes it possible to generate new and different alternative options against unexpected events (Çelikkaleli, 2014; Curran & Andersen, 2017), it also makes it easier to resist and adapt in the face of difficulties (Demirtaş, 2020). Furthermore, a high level of cognitive flexibility provides the opportunity to be aware of alternative options in the face of difficulties and thereby to generate more solutions in coping with difficulties (Deveney & Deldin, 2006; Ionescu, 2012; Moore et al., 2017).

The use of humor, which is a mental reward mechanism (Cheng & Wang, 2015), is an important facilitating method in the effective use of cognitive processes. The fact that positive humor possesses a mental reward system can change the individual's perspective both towards himself and towards life. Having such an outlook is an effective way for an individual to grow on the way to realizing his/her potential. The fact that an individual uses humor in coping with problems in daily life is seen as a facilitating factor on the road to personal development (Yerlikaya, 2003). Therefore, the use of humor can be seen as a practical way for the individual to recognize and reflect his/her own self. In fact, there are studies showing that humor enables cognitive structuring and contributes to cognitive evaluation through emotion regulation (Kolburan et al., 2019).

According to the model tested as a result of the study, considering the findings that cognitive flexibility predicts psychological hardiness and that positive humor styles and happiness have a mediating role in this relationship, it can be said that the individual can strengthen his/her psychological hardiness by increasing his/her control over cognitive processes. Since psychological hardiness, which has an important relationship with cognitive flexibility, positive humor styles and happiness, is affected by many environmental and individual factors (Friborg et al., 2005), it may be more appropriate to consider it as a process open to change rather than being a fixed component of human nature.

Considering that teachers spend a large part of their time with their students and colleagues at school, it is very important for them to have psychological hardiness both for themselves and in terms of their professional lives. Psychologically resilient individuals can analyze situations better and steer these situations in the desired direction (Luthar et al., 2000).

This will facilitate teachers both in their private and professional lives, and will prevent them from experiencing too many problems with their jobs and colleagues. Moreover, due to the ability of psychologically resilient individuals to solve problems when they experience them, they can solve the negative effects of an event before they get worse with a constructive and calm attitude, and therefore, it can be said that teachers who have this quality can work more efficiently and contribute more to the schools/institutions where they work.

Limitations

The first of the limitations of this study is the limitation regarding the sampling method. The fact that the majority of the participants selected by the convenience sampling method were relative newcomers to the profession (mean age = 30.9 ± 6.95) constitutes an important limitation in terms of the generalizability of the study. Another limitation of the study is that only cognitive flexibility, positive humor and happiness were considered in explaining psychological hardiness. Other factors also have an impact in explaining psychological hardiness. The fact that the participants were teachers constitutes another limitation in terms of generalizability of the study for other segments of society. Moreover, the fact that the data were collected with self-report measurement tools may have caused some scores in the data obtained from the scales to be high due to the social desirability factor. In addition, the validity and credibility of the data are limited by the data collection tools used. Finally, the COVID-19 pandemic conditions constitute another limitation of the study. Since the data were collected during the pandemic period, the scale items may have affected the participants' responses in this context.

Recommendations

In this study, it was found that cognitive flexibility predicts psychological hardiness through positive humor styles and happiness. Since there are a great many factors affecting psychological hardiness, the mediating role of different variables for explaining psychological hardiness can be examined in future studies. It can be recommended that studies be conducted on environmental and familial protective factors in addition to personal protective factors in explaining psychological hardiness. In order to overcome the limitation arising from the fact that the research was carried out with teachers, more comprehensive results can be obtained by examining the same variables with different occupational groups or individuals. Since the mean age and length of service of the teachers who participated in the research was low (mean age = 30.9, mean length of service = 6.22 years), it can be recommended that studies be conducted with a larger population. Moreover, in order to overcome the limitation arising from

the cross-sectional design of the study, similar variables can be examined longitudinally. In this way, the effect of psychological hardiness on cognitive flexibility, positive humor styles and happiness can be monitored over time. Since the research was conducted with a correlational survey model, it can be recommended that experimental studies be carried out to explain psychological hardiness in different studies. Experimental studies can be carried out with psychoeducational groups, including cognitive flexibility, positive humor and factors that can increase happiness.

When the findings obtained from the study are considered in terms of the importance and structure of the teaching profession, it is thought that studies in the field of positive psychology for teachers should be increased. It is considered that training should be focused on cognitive flexibility, which is one of the concepts of cognitive psychology, and psychological hardiness, which is one of the concepts of positive psychology. Teachers can be informed about the advantages of increasing cognitive flexibility both for themselves and for their students. Furthermore, in-service training or seminar-style activities can be conducted on how teachers can further develop their own cognitive flexibility while carrying out their teaching.

Data availability The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethical approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent Informed consent was obtained from all the individual participants that were included in the study.

Conflict of interest The authors declare that they have no conflict of interest.

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