| Research Article / Araştırma Makalesi|

Investigation of the Relationship Between Cognitive Flexibility Levels and Social Interest Levels of University Students

Üniversite Öğrencilerinin Bilişsel Esneklik Düzeyleri ile Sosyal İlgi Düzeyleri Arasındaki İlişkinin İncelenmesi

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Abstract

Purpose: In this study, the relationship between the cognitive flexibility score of university students and their social interest levels was investigated. In line with this main purpose; the moderator role of variables such as age, department and grade on this relationship was also examined.

Design/Methodology/Approach: The participants of the study consist of, 344 female and 256 male totally 600 undergraduate students. The research was designed in correlational survey model. "Social Interest Scale" and "Cognitive Flexibility Inventory" were used to collect data. SPSS PROCESS was used in the analysis of the data. The linear regression statistical technique was used to determine the moderation effect.

Findings: Positive and significant relationship at medium level was observed between cognitive flexibility and social interest levels of university students. Results; social interest, age, and department are significant predictors of cognitive flexibility.

Highlights: It was observed that high social interest scores caused an increase in the cognitive flexibility scores of the participants in the group at the age of 24 years and older. While the moderation effect of social interest on cognitive flexibility is at the highest level in psychological counseling and guidance department considering undergraduate students, this group is followed by undergraduate students from primary school teaching and preschool teaching departments, respectively.

Öz

Çalışmanın amacı: Bu çalışmada, üniversite öğrencilerinin bilişsel esneklik düzeyleri ile sosyal ilgi düzeyleri arasındaki ilişki incelenmiştir. Bu temel amaç doğrultusunda; yaş, bölüm ve sınıf düzeyi değişkenlerinin bu ilişki üzerindeki düzenleyici rolüne de bakılmıştır. Araştırmanın katılımcılarını 344'ü kadın 256'sı erkek toplam 600 lisans öğrencisi oluşturmaktadır.

Materyal ve Yöntem: Araştırma ilişkisel tarama modelinde tasarlanmıştır. Verilerin toplanmasında, "Toplumsal ilgi Ölçeği" ve "Bilişsel Esneklik Envanteri" kullanılmıştır. Verilerin analizinde SPSS PROCESS kullanılmıştır. Düzenleyici etkinin belirlenmesi için lineer regresyon istatistiksel tekniği kullanılmıştır.

Bulgular: Üniversite öğrencilerinin bilişsel esneklik ile sosyal ilgi düzeyleri arasında pozitif yönde ve orta düzeyde anlamlı ilişki olduğu görülmüştür. Bulgular; sosyal ilgi, yaş ve bölümün bilişsel esnekliğin anlamlı birer yordayıcısı oldukları yönündedir.

Önemli Vurgular: Yüksek sosyal ilgi puanlarının en çok 24 yaş ve üzeri gruptaki katılımcıların bilişsel esneklik puanlarında artışa neden olduğu görülmüştür. Sosyal ilginin bilişsel esneklik üzerindeki düzenleyici etkisi rehberlik ve psikolojik danışmanlık lisans öğrencilerinde en yüksek düzeyde iken, bu grubu sırasıyla sınıf öğretmenliği ve okul öncesi öğretmenliği lisans öğrencileri izlemektedir.

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INTRODUCTION

Individuals can encounter different life problems at each period of development. These problems differ according to age, gender, developmental period and personality characteristics of the individual. In this process, it is important for individuals to be able to produce alternative solutions to the problems they encounter with different perspectives and to establish healthy relationships with their environment in order to adapt quickly to the changes that occur in their lives. According to the cognitive behavioral approach, cognitive restructuring of the mind and executive functions' being more active are related to the transitions between thoughts. Especially, developing functional thoughts instead of automatic negative thoughts, which are more common in individuals with depression, is a condition that requires cognitive change and cognitive flexibility (Dennis & Wall, 2010; Johnco, Wuthrichand, & Rapee, 2014). According to Martin and Andersan (1998), cognitive flexibility includes three important situations. First of all, cognitive flexibility includes an individual's awareness of any subject. Second, it includes being cognitively flexible and willing to adapt to the situation, and finally, it includes one's beliefs about self-efficacy and flexibility. Cognitive flexibility is defined as "a quality of human cognition" and an aspect of executive performance. Executive performances are a set of interconnected internal skills such as controlling, planning and organizing desires considered necessary for higher up mental functions such as problem solving and creativity. In general, the main element of cognitive flexibility is the individual's ability to adapt to changing environmental stimuli (Rahimi, Meratian, & Mahmoodabadi, 2018). At this point, the necessity of cognitive flexibility concept for psychological adjustment was noticed and the need to investigate the subject in detail emerged.

Alfred Adler was one of the first theorists who emphasized the social aspect of human beings and examined the relational context of family members (especially sibling relationships) in psychology literature (Bacanlı, 1997; Corey, 2008, Geçtan, 2017). In general, the individual, then the family and the society which is formed by the union of families, take place at the first step of the Adler's approach. Alfred Adler, who emphasized the individual's unique social environment and the importance of interaction with the environment in shaping behaviors, named his theory "Individual Psychology" (Schultz & Schultsz, 2017). According to Adler's theory of individual psychology, all behaviors of the individual is social. Considering this situation, perhaps social interest is emphasized as the most prominent concept of the theory (Akçabozan & Sümer, 2016). According to Adler, social interest is the main characteristic of every individual and it is involved in all actions. As social interest develops, so does the mind, because intelligence is a social function (Ansbacher, 1991). According to Adler, social interest develops with potential consciousness which is innate. An individual, whose social interest is sufficiently developed, makes efforts to cope with life struggles and strives for self-realization. Social interest involves conceptions such as cooperation, equality of all humanity, acceptance of others and self, contributing to humanity, showing respect and taking responsibility (Soyer, 2004). Likewise, Mosak (1991) states that individuals with high social interest can accept other people's and their own mistakes, strive to contribute to the welfare of the society, have high self-confidence and they are open to cooperation.

Adler states that the main feature of normal and healthy behaviors is the ability to deal with various problems that people face in their environment effectively. People constantly encounter problems throughout their life. Being able to overcome these problems is related to individual's ability to solve problems at a certain level. Producing solutions to problems requires certain flexibility in thought patterns (Geçtan, 2017). When the literature is examined it is clearly understood that a person must have a certain social interest potential in order to develop this flexibility (Ansbacher, 1991; McClain, 2005). Considering all these findings, individuals, who need care, support and socialization from the moment of birth, are supposed to have a certain level of cognitive flexibility and social interest in order to adapt to the existing world order, be strong against the problems and develop social-cognitive aspect in a balanced way. Adler states that social interest is necessary for mental health, affects the behavior, emotions and thought processes, and encourages the individual. This provides a certain level of flexibility in the behavior and cognitive processes of the individual and encourages social development (McClain, 2005). In this study, based on all these findings, it was thought that the individual's cognitive flexibility and social interest level might be related to each other, and the relationship between these two variables was examined based on this conceptual context.

Young adulthood period can be considered as a period in which young people, especially those who study at university, gain their autonomy regarding their own lives and fulfill many developmental tasks. During this period, students can also encounter various developmental problems and develop various skills to solve these problems. Among the problems experienced by many university students, situations such as social adaptation, economic difficulties, future anxiety, separation from the family for university education, efforts to adapt to a new socio-cultural environment, differences in interpersonal relations, etc. are included. When it comes to the steps to solve these problems, it is possible for students to use the options around them positively and indicate a rapid cognitive and social development as well as indicating a behavior which is just the opposite. Since it is thought that these differences among students' perspectives and how they handle developmental problems in this important period of preparation for adulthood and life can be related to their cognitive flexibility and social interest levels, this issue needs to be investigated.

Other points that emphasize the importance of examining these two concepts together are as follows: Adler considered social interest as a cognitive function that is potentially innate but needs to be developed consciously (Ansbacher, 1991a). Kaplan (1991a) discussed social interest considering cognitive, affective and behavioral dimensions and emphasized the importance of "compromising and flexible" concept in solving life problems. In addition to this situation, Adler discussed social interest as an indicator of mental health; considered the reason for maladaptive behaviors of the individual as lack of social interest, and pointed out that maladaptive behaviors must be replaced with adaptive behaviors in order to have high social interest (Soyer, 2001). Basically the meaning of the cognitive flexibility concept can be summarized as being able to adapt, to approach problems with a

flexible perspective, to produce alternative options, to establish positive, harmonious and balanced interpersonal relationships (Martin & Anderson, 1998).

Purpose and Importance of the Research

Considering the content of cognitive flexibility and social interest concepts, it can be stated that they are related. When this relationship between the two concepts is examined, as the cognitive flexibility level of the individual develops so the development of social interest level of the individual is expected, and because of this relationship, this issue constitutes the focus of the research.

The main purpose of this research is to investigate the relationship between the cognitive flexibility levels of university students and their social interest levels. In line with this main purpose, the moderator role of variables such as age, department of education and grade level in the relationship between university students' cognitive flexibility and social interest levels was also discussed in the study. In line with this main purpose, answers to the following questions were searched in the study:

1-Is there a significant relationship between cognitive flexibility levels of university students and their social interest levels?

2-What is the moderator role of age in the relationship between cognitive flexibility levels of university students and their social interest levels?

3-What is the moderator role of department in the relationship between cognitive flexibility levels of university students and their social interest levels?

4-What is the moderator role of grade in the relationship between university students' cognitive flexibility levels and their social interest levels?

METHOD

This research is a descriptive study using the correlational survey model. Correlational survey is a research model that aims to determine the presence and/or level of covariance between two or more variables (Karasar, 2016). In this study, first of all, the existence and level of the relationship between cognitive flexibility levels of university students and their social interest levels was aimed to be explained by using the correlation type correlational survey model. In a study, the variables that can affect the direction and the strength of the relationship between dependent and independent variables are called moderating variables (Gürbüz & Şahin, 2018). Moderation effect analysis is used when it is aimed to determine whether the relationship between two variables depends on the value of a third variable cluster (Hayes, 2012). After examining the existence and level of the relationship between dependent variable (cognitive flexibility) and independent variable (social interest) in the study, moderation effects of age, department and grade variables on the relationship between university students' cognitive flexibility levels and social interest levels were examined.

Participants

The study group of the research consists of 344 female and 256 male totally 600 undergraduate students, who live within the cities of Ankara and Konya and continue their education in the 1st and 4th grades of Gazi University Gazi Faculty of Education and Necmettin Erbakan University Ahmet Keleşoğlu Faculty of Education in the spring semester of 2018-2019 academic year, and volunteered to participate in the research. Information regarding the demographic characteristics of the participants in the study group is given in Table 1.

Table 1. Descriptive statistics regarding demographic characteristics of the participants in the study group

Variables		Frequency (f)	Percentage (%)
Gender	Female	344	53,7
	Male	256	42,7
	Total	600	100
Age	18-20	214	35,7
	21-23	323	53,8
	24+	63	10,5
Department	PCG	211	35,2
	Primary School Teaching	175	29,2
	Preschool Teaching	214	35,7
Attending University Near or Apart From Family	Apart From Family	381	63,5
	Near Family	219	36,5
Mother Educational Status	Illiterate	17	2,8
	Primary School	312	52,0
	Secondary School	116	19,3
	High School	97	16,2
	University	56	9,3

	Postgraduate	2	,3
	Illiterate	2	,3
Father Educational Status	Primary School	162	27,0
	Secondary School	119	19,8
	High School	163	27,2
	University	144	24,0
	Postgraduate	10	1,7
University	Gazi University	313	52,2
	Necmettin Erbakan University	287	47,8

When Table 1 is examined in terms of gender variable, it is seen that the number of female (53.7%) participants is more than male (42.7%) participants. Considering the age rate, it is seen that the age range is mainly 21-23 (53.8%). Considering the department studied, it can be stated that the number of participants is close to each other among the three departments of PCG (35.7%), primary school teaching (29.2%) and preschool teaching (35.7%). In the research, the question whether the students continue their university education near the family or apart from the family was asked, which means being in a different city or not. According to this, it is seen that 63.5% of the students continue their university education in another city apart from their families. When the mothers' educational status is examined, it is seen that they are mostly at primary school level (52.0%). On the other hand there is a relatively more balanced distribution among primary school, secondary school, high school and university levels considering fathers' educational status. Finally, it can be stated that there is a balanced distribution in the number of participants of the two universities that constitute the study group.

Measures

"Personal Information Form" which was developed by the researcher, "Cognitive Flexibility Inventory" which was adapted into Turkish by Sapmaz and Doğan (2013), and "Social Interest Scale" which was adapted into Turkish by Soyer (2004) were used as data collection tools in this study. In the personal information form, there are items related to the participants' age, gender, university, department, grade, whether they studied at the university near the family or apart from the family, mothers' educational status, fathers' educational status and perceived socio-economic level.

"Cognitive Flexibility Inventory" originally developed by Dennis & Wall (2010), consists of 20 items, 7 point Likert type and 2 sub-dimensions (control and alternatives). The inventory measures the tendency of individuals to perceive difficult situations as manageable, their ability to produce multiple alternative solutions to difficult situations, and the ability to perceive multiple alternatives for life events and human behaviors. Turkish adaptation of the scale was completed by Sapmaz and Doğan (2013) at the end of a two-stage process in which university students participated. The validity study of the scale was carried out with criterion-related validity, confirmatory and exploratory factor analysis methods. Factor analysis results indicated that the scale had a two-factor structure. Cronbach alpha reliability coefficient of the Cognitive Flexibility Inventory was obtained as .90 for the whole scale, .90 for "alternatives" sub-dimension, and .84 for "control sub-dimension". Test-retest reliability coefficient was found .75 for the whole scale, .78 for the "alternatives" sub-dimension and .73 for "control sub-dimension" (Sapmaz and Doğan, 2013). The final version of the scale was formed as a 5-point Likert type with 20 items. Three different types of scores can be obtained in the scoring; total cognitive flexibility score, "alternatives" sub-dimension score and "control" sub-dimension score (Sapmaz & Doğan, 2013).

In the reliability analysis conducted within the scope of this study, the Cronbach Alpha coefficient calculated for the total score of Cognitive Flexibility Inventory was .88; 84 for control sub-dimension and .90 for alternatives sub-dimension.

"Social Interest Scale" was originally developed as a 32-item scale by Greever, Tseng, and Friedland (1973). Turkish adaptation of the scale was made by Soyer (2004). The scale was first presented to the opinion of 10 experts who had profession on Alfred Adler's theory, and the translation validity of the scale was made. In accordance with the opinions of the experts, it was concluded that the items of the 32-item scale were insufficient in terms of reflecting social interest. The scale was initially increased to 110 items, and expert opinion was taken again and then it was reduced to 80 items. The 80-item version of the scale was applied to 400 university students. For the construct validity of the scale, factor analysis was performed with the principal component analysis method. Cronbach alpha internal consistency coefficient for the reliability of the scale was found ,88 and test-retest method was found ,82 (Soyer, 2004). The final version of the scale is a 52-item one-dimensional 5-point Likert-type rating scale. A high score obtained from the scale means high social interest (Soyer, 2004).

In the reliability analysis performed within the scope of this study; Cronbach Alpha coefficient calculated for the total score of Social Interest Scale was found .95. Obtaining Cronbach Alpha value above .70 indicates that the scale is reliable (DeVellis, 2016). Thus, it can be stated that the reliability coefficient is high.

Data Collection Process

First of all, necessary permissions were taken in order to collect the research data and perform the application. The data was collected in a four-week period during spring term in May 2018-2019 academic year. The research was conducted with the 1st and 4th grade students studying in the undergraduate programs of Psychological Counseling and Guidance, Primary School Teaching,

and Preschool Teaching from Gazi University Gazi Faculty of Education (313 people) and Necmettin Erbakan University Ahmet Keleşoğlu Faculty of Education (287 people). Before the application, the participants were given detailed information about the content and purpose of the research.

Analyzes of Data

IBM SPSS 25.00 package program was used in the analysis of the data collected within the scope of the research. Before analyzing the data, the data set was checked and errors were corrected. Then, items were reversed and unanswered items were examined. After these processes, kurtosis and skewness coefficients were examined in order to analyze whether the data indicated a normal distribution. Table 2 presents the results of kurtosis and skewness coefficient regarding the distribution of scores obtained from the total and sub-dimensions of the scales for normality test.

Table 2. Analysis results of the scales regarding normality test: Kurtosis and skewness values

Measurement Tools		Skewness	Kurtosis
Social Interest	Total Score	-,429	-,129
	Alternatives Sub-dimension	-,353	,275
Cognitive Flexibility	Control Sub-dimension	-,138	-,084
	Total Score	,145	-,335

When Table 2 is examined, it is seen that skewness and kurtosis coefficients of the total and sub-dimension scores of the measurement tools are between -1.5 / +1.5. As a result, it was accepted that the scores obtained from the scales indicated normal distribution (Tabachnick & Fidel, 2007).

Parametric techniques were used in statistical analyzes performed after testing that the data indicated normal distribution. Cronbach alpha values were calculated in order to determine the reliability of the scales for this study group. In order to test the moderation effect, the correlation between dependent variable and independent variable must be significant (Baron & Kenny, 1986). Accordingly, in this study, social interest was considered as independent variable and cognitive flexibility as dependent variable, and Pearson Product Moment Correlation Coefficient was calculated to determine the relationship between social interest and cognitive flexibility variables, and a significant relationship was obtained ($r=$,527; $p<$,01). Linear regression statistical technique was used in analyzes to determine whether there is a moderation effect or not. Process Syntax of Hayes (2012) was used while creating graphs for the variables.

While examining the moderation effects, first of all, all scale scores were standardized converting into (Z) scores. While the scores of participants obtained from the Cognitive Flexibility Inventory were included in the model as the predicted variable, the scores they obtained from Social Interest Scale and the variables of which moderator role was examined (age, department, grade) and "the variable of which moderator role was examined x Social Interest scores" were included in the model as predictive variables. While interpreting the results of the analysis, the t values and significance level of the variable "the variable of which moderator role was examined x social interest scores" was examined and it was decided whether the relevant variable had a moderator role or not (Hayes, 2017).

FINDINGS

In the research, firstly, an answer was searched for the question "Is there a significant relationship between cognitive flexibility and social interest levels of university students?" Pearson Product-Moment Correlation Coefficient was calculated in order to determine the relationship between the scores obtained by university students from the sum of Social Interest Scale and Cognitive Flexibility Inventory and sub-dimensions. The results obtained are presented in Table 3.

Table 3. Results of correlation analysis regarding the relationship between cognitive flexibility and social interest levels of university students

	Social Interest	Alternatives	Control	Cognitive Flexibility Total
Social Interest	1			
Alternatives	,571**	1		
Control	,225**	,292**	1	
Cognitive Flexibility Total	,527**	,870**	,725**	1

n= 600, **$p <$,01

When Table 3 is examined, it is seen that there is a positive and significant relationship at medium level between cognitive flexibility levels of university students and their total scores of social interest levels ($r=$ .527, $p <$.05). While there is a positive and medium relationship between social interest and alternatives sub-dimension of Cognitive Flexibility Scale ($r=$ .571, $p <$.05), there

is a positive and significant relationship between social interest and control sub-dimension at low-level (r= .225, p <.05). In line with these results, it can be stated that students with high social interest levels also have high cognitive flexibility levels.

Another question to be answered in the research was "What is the moderator role of age in the relationship between cognitive flexibility levels of university students and their social interest levels? The results of the linear regression analysis regarding the moderator role of age are presented in Table 4.

Table 4. Results of regression analysis regarding the moderator role of age in the relationship between cognitive flexibility and social interest levels of university students

Variables	B	Standardized β	t	p
Age	1,514	,095	2,736	,006
Social Interest	5,145	,483	4,498	,000
Age x Social Interest	,246	,043	,402	,688
R=,536	R^2=,28	F= 80,085	p=,000	

When Table 4 is examined, it is seen that age, social interest and "age*social interest" variables altogether explain 28% of cognitive flexibility (F=80,085, p<,001). When the results are evaluated together, while social interest (t= 4,498, p <,05) and age (t = 2,736, p <,05) are significant predictors for cognitive flexibility; age*social interest variables (t=,402, p >,05) are not significant predictors. Accordingly, it is not possible to mention a total moderator effect of age regarding the relationship between cognitive flexibility and social interest levels. Figure 1 indicates the graph created regarding the effect of age variable on the relationship between cognitive flexibility and social interest levels.

Figure 1. The moderator role of age in the relationship between cognitive flexibility and social interest levels

When Figure 1 is examined, it is seen that the colored bars are close to each other and there is a similar relationship between social interest and cognitive flexibility levels in all age groups. While low social interest scores decrease the cognitive flexibility scores of the participants in the 18-20 and 21-23 age groups, almost similarly, high social interest scores increase the cognitive flexibility scores of the participants in 24 and older age group. However, the group with the highest cognitive flexibility score among the three groups is the participants aged 24 and older. While the effect of social interest level on cognitive flexibility was higher in participants aged 21-23 (R^2=,327) this group was followed by participants aged 18-20 (R^2=,229) and those aged 24 and older (R^2=,200). Considering the fact that age groups of the participants were close to each other it can be stated that the moderator effect of age on the relationship between cognitive flexibility and social interest levels was not revealed. In addition, it is seen that the level of social interest, which increases as age increases, boosts the level of cognitive flexibility. At this point, it can be expressed that social interest and cognitive flexibility are skills that can be developed with increasing age.

Another question to be answered in the research was "What is the moderator role of the department in the relationship between cognitive flexibility and social interest levels of university students?" The results of the linear regression analysis regarding the moderator role of department in the relationship between these two variables are presented in Table 5.

Table 5. Results of regression analysis regarding the moderator role of department in the relationship between cognitive flexibility and social interest levels of university students

Variables	B	Standarized β	t	p
Department	-1,692	-,142	-4,040	,000
Social Interest	6,910	,649	7,295	,000
Department x Social Interest	-,477	-,097	-1,097	,273
R=,546 R²= ,29 F= 84,600 p=,000				

When Table 5 is examined, it is seen that the variables of department, social interest and 'department*social interest' altogether explain 29% of cognitive flexibility in the established model (F= 84,600, p <,001). However, in the established model, while department (t=-4,040, p<.05) and social interest (t= 7,295, p <.05) were significant predictors for cognitive flexibility; department*social interest variables (t= -1,097 p >,05) were not significant predictors. In other words, it cannot be stated that department has a total moderation effect on the relationship between cognitive flexibility and social interest levels. In Figure 2, there is a graph created regarding the effect of department on the relationship between cognitive flexibility and social interest levels.

Figure 2. The moderator role of the department in the relationship between cognitive flexibility and social interest levels

When Figure 2 is examined, it is seen that colored bars are close to each other, in other words, there is a similar relationship between cognitive flexibility and social interest in all departments. While low social interest scores decrease cognitive flexibility scores of the students studying in Psychological Counseling and Guidance (PCG) and preschool departments at a similar level, it decreases the cognitive flexibility scores of the students studying in the primary school teaching department the most. High social interest scores increase cognitive flexibility scores of the students studying in the counseling department the most. While the effect of social interest on cognitive flexibility is the highest among students studying in the field of PCG (R²=,339), this group is followed by students from the primary school teaching department (R²=,333). It was determined that the effect of social interest on cognitive flexibility was the lowest in preschool teaching department (R²=,234). When the findings of the study are examined, it is a remarkable result that the effect of social interest on cognitive flexibility is the highest in PCG students. It can be stated that the program content and professional basis of the PCG department is based on human relations and also PCG students receive more in-depth training on the cognitive, social, affective and behavioral development of the individuals compared to other fields might be effective in the emergence of such a result in the research. However, the departments of which moderator effects were investigated being affiliated to the same faculty and even partially the similarities in the student profile might not have totally reflected the moderator role of department in the relationship between cognitive flexibility and social interest.

The last question to be answered in the research was "What is the moderator role of grade in the relationship between university students' cognitive flexibility levels and their social interest levels?" The results of the linear regression analysis regarding the moderator role of grade are presented in Table 6.

Table 6. Results of regression analysis regarding the moderator role of grade in the relationship between cognitive flexibility and social interest levels of university students

Variables		B	Standardized β	t	p
Grade		,377	,056	1,619	,106
Social Interest		5,801	,545	7,898	,000
Grade x Social Interest		-,058	-,016	-,235	,814
R=,530	R^2=,28	*F*=77,576	*p*=,000		

When Table 6 is examined, it is seen that students' grade, social interest and 'grade *social interest' variables altogether explain 28% of cognitive flexibility (*F*= 77,576, *p* <.001). However, in the established model, while social interest was a significant predictor for cognitive flexibility (*t*= 7,898, *p* <.05), grade (*t*= 1,619, *p* >.05) and grade*social interest (*t*=-,235, *p* >,05) were not significant predictors of cognitive flexibility. In other words, it is not possible to mention a total moderator effect of grade on the relationship between cognitive flexibility and social interest. In Figure 3, there is a graph that indicates how grade affects the relationship between cognitive flexibility and social interest.

Figure 3. The moderator role of grade in the relationship between cognitive flexibility and social interest levels

When Figure 3 is examined, it is seen that colored bars are close to each other and there is a similar relationship between cognitive flexibility and social interest according to the grade. However when the situations, in which the high and low effects of grade on the relationship between cognitive flexibility and social interest, are compared, the moderator effect of grade is stronger in low social interest and cognitive flexibility scores; the moderator effect of grade is weaker in high social interest and cognitive flexibility scores. While low social interest scores decrease cognitive flexibility scores of the students studying in the 1st grade most, high social interest scores increase cognitive flexibility scores of the students studying in the 4th grade most. While the effect of social interest on cognitive flexibility is higher in 4th grade students (R^2=,282), it is lower in 1st grade students (R^2=,279).

When this finding of the study is examined, it is seen that grade variable does not have a total moderator effect on the relationship between cognitive flexibility and social interest. This situation can be interpreted as university education does not have an effect that makes a change in social interest and cognitive flexibility levels during the period between the 1st and 4th grade. External factors such as professional development and theoretical knowledge being predominant in the education programs of universities, students' anxiety about passing the courses and exams might have caused students turn to different activities that improve their social interest and cognitive flexibility levels. However, the grades which were examined correspond to the same developmental period (young adulthood). This situation can be taken into account as grade variable does not have a total moderator effect on the relationship between cognitive flexibility and social interest.

DISCUSSION

According to the correlation analysis conducted to determine the relationship between university students' cognitive flexibility and social interest levels, which is the main purpose of this study, it was seen that there was a positive, significant relationship at medium level between the total scores of university students' cognitive flexibility and social interest levels. It was found that there was a positive correlation at medium level between the total scores of social interest and alternatives sub-dimension of Cognitive Flexibility Inventory, and a low-level positive correlation between control sub-dimension and total social interest scores. Although other studies, in which the variables of social interest and cognitive flexibility were directly discussed together, could not be found, some studies conducted regarding a similar theme in which social interaction of development and cognitive flexibility of the individual is indicated, support this finding of the research (Ansbacher, 1991, 1991a; Bandura, 1999; İşçioğlu, 2020; Koesten, Schrodt, & Ford, 2009; Mcclain, 2005; Martin & Rubin, 1995; Nikelly, 2005). In addition findings of the study by Ciairano, Bonino & Miceli, (2006) indicate that children with a high level of cognitive flexibility have a higher level of cooperation and social competence. Human development can be considered as a multi-directional concept, including cognitive, emotional and social processes. In addition, university life is a period that can offer individuals an abundance of experiences from different perspectives. It can be thought that this finding of the research can be considered as the social and cognitive development of individuals support and complete each other, and this situation is positively and significantly reflected on the relationship between students' cognitive flexibility levels and social interest levels.

Finding a positive and significant relationship between university students' cognitive flexibility and social interest levels in this study supports the content of the collective vision developed as a framework for 21st century learning. This vision was developed collaboratively by different companies and organizations in the USA such as Cisco, Apple, National Education Association, and was generally accepted and referenced in some studies by Brown (2018), Lamb, Maire, & Doecke, (2017) (Cansoy, 2018). In the content of this vision there are concepts that emphasize the meaning of cognitive flexibility such as flexibility, problem solving and adaptability to changes; skills that emphasize the content of social interest concept such as social and cultural skills, responsibility and cooperation that an individual must have for success and harmony in the 21st century (Partnership for 21st Century Learning-P21, 2009). In addition, Wagner (2008)'s study, which emphasizes the characteristics such as mental agility and flexibility, cooperation, entrepreneurship and problem-solving skills that individuals must have in order to be successful, is similar. As a result, the findings of the research reflect and support the studies of previous researchers who stated that being able to indicate a balanced social and cognitive development, creating right solutions to problems, seeing alternative options in difficult situations require a certain flexibility in thought patterns, and that the individual must have a certain social interest potential in order to develop this flexibility (Ansbacher, 1991; Geçtan, 2017; Mcclain, 2005; Nikelly, 2005).

Considering the results of the regression analysis regarding the moderator role of age in the relationship between university students' cognitive flexibility and social interest levels, it is not possible to mention a complete moderator effect of age. It was understood that age, social interest and "age x social interest" variables altogether explained 28% of cognitive flexibility. However, when social interest and age variables are considered separately, they are significant predictors of cognitive flexibility; age did not have a moderator effect on the relationship between cognitive flexibility and social interest. Also among the three age groups (18-20, 21-23 and 24 years and older), the group with the highest cognitive flexibility is the participants aged 24 and older. This finding of the study supports the studies that cognitive flexibility increases with age (Atayeter, 2020; Bock, Gallaway, & Hund, 2015; Çiftçi, 2017; Üzümcü & Müezzin, 2018). Another result of the study is that high social interest scores increase the cognitive flexibility scores of the participants who are in the age group of 24 and older most. Individuals in this age group are majorly in the fourth grade. As a natural consequence of this, it can be stated that this age group was able to adapt better to university life and differences, have different experiences, have more advanced cognitively and develop themselves. In short, they can be considered as individuals who learn more, produce more and become more open to socialization. This finding of the study can be summarized as increasing the level of social interest as the age increases, causing an increase in the level of cognitive flexibility. At the same time, this finding supports the results of studies indicating that the level of social interest increases as age increases (Greverr, Tseng & Friendland, 1973; Meunier & Royce, 1988).

When the relationship between cognitive flexibility and social interest level of university students is considered from general view it was found that the group at the age of 21-23 differentiated this relationship more clearly. This age group corresponds to the middle of the developmental period, which Arnett (2000) considers as emerging adulthood (18-25 years old). In summary it is the period in which individuals focus on themselves most, have the opportunity to make use of the opportunities around, deciding individually in many different areas, in short, when they are most free and have social interaction most (Arnett, 2015; Atak & Çok, 2010). From this point of view, the age range of 21-23 can be considered as the period in which many social, cognitive and emotional changes and developments are experienced the fastest and the individual is most open to self-development. Therefore the difference between the situations, where low and high effects of the 21-23 age range on cognitive flexibility and social interest relation, can be more apparent.

Considering the results of the regression analysis on the moderator role of the department (PCG, primary school teaching and pre-school teaching) in the relationship between the cognitive flexibility and social interest levels of university students, it is seen that it is not possible to mention a total moderation role of department. It was seen that the variables of department, social interest and "department x social interest" altogether explained 29% of cognitive flexibility.

In addition, when social interest and department variables are considered separately, whereas they are significant predictors of cognitive flexibility; department did not have a moderation effect on the relationship between cognitive flexibility and social interest. Considering the fact that all three of the compared departments are from the faculty of education and they are from the field of social sciences it can be stated that this situation might have affected the department's lack of a moderator effect on the relationship between social interest and cognitive flexibility. In this study, it was concluded that high social interest scores increase cognitive flexibility scores of the students who study in PCG most. Psychological Counseling and Guidance (PCG) is a field based on human relations that requires one-to-one and face-to-face communication with the individual, requiring an empathetic understanding, unconditional positive acceptance and helping individuals who need psychological support. Therefore, it can be stated that high level of social interest of an individual, who preferred to study PCG, is a precondition for basic counseling skills that are expected and required in this profession. As a result, if the effect of social interest on cognitive flexibility is lined up according to the fields examined this effect is seen in the students studying in PCG department at the highest level, and it is followed by the students in primary school teaching and preschool teaching, respectively. In a study investigating whether cognitive flexibility levels of students studying primary school teaching and preschool teaching differ according to the department or not, it was found that there was no significant difference between the two departments (Esen-Aygun, 2018). This finding supports the results of this study, albeit indirectly. Factors such as primary school teaching and pre-school teaching are included in the Elementary School Department, and there is no major difference in the content of the education programs except for the field education courses, and the students' having similar cognitive functions might have been effective in the emergence of such a result.

According to the results of the regression analysis on the moderator role of grade in the relationship between university students' cognitive flexibility and social interest levels, it is seen that grade does not have a total moderator effect. Students' grade, social interest levels and "grade x social interest levels" variables altogether explain 28% of cognitive flexibility. It was understood that the effect of social interest level on cognitive flexibility level was higher in students attending the fourth grade, while it was lower in students attending the first grade. Considering the grade levels examined, the students studying in the 1st and 4th grades are in the same developmental period as young adulthood, and their age is close to each other might have been effective in students' having similar social interest and cognitive flexibility levels. Therefore, the moderator effect of grade might not have been observed in the relationship between cognitive flexibility and social interest. There are studies based on the relational correlation method in which social interest and cognitive flexibility levels are examined with grade variables in different studies separately. Considering the studies in which social interest is examined according to the grade in the study of Soyer (2001) the social interest scores between 1st and 4th grade students were examined. While the average social interest score of the 4th grade students was 166,05, 4th grade students' score was 164,98. As a result, no statistically significant difference was found between social interest and grade. Önal (2019) compared the social interest levels of university students with their grade levels and found that although there was a slight increase in their scores as the grade level increased in 1st, 2nd, 3rd, and 4th grade students, when the scores of 1st and 4th grade students compared it was concluded that there was no statistically significant difference between social interest and grade. Considering the studies examining cognitive flexibility in terms of grade, Yücel, Karahoca & Karahoca (2016 made a comparison between 2nd and 3rd grades and found no significant difference. Başpınar (2019), on the other hand, made a comparison between the 1st, 2nd, 3rd and 4th grades of the university students and found that 4th grade students had the highest cognitive flexibility. Here, again, it is seen that the age factor plays a role in the 4th grade students having the highest cognitive flexibility, and cognitive flexibility increases with increasing age.

Considering the studies conducted, it was determined that the comparisons between grade levels are mainly aimed at university students. A comparison to be made between different education levels and grade levels (such as high school) can reveal more significant results in terms of both social interest and cognitive flexibility levels in order to see the change between grades in the relationship between these two variables. The period until university, that is, the time from adolescence to the age of twenties is of great importance for the individual. Individuals mainly complete their basic development and basic education-teaching process (Chisholm & Hurrelmann, 1995). In other words, it can be stated that, individuals come to university when they complete the most basic steps of social and cognitive development. Therefore, having reached a certain level of maturity and coming to university with a largely established level of social interest and cognitive flexibility might not have created a significant difference between grade levels at the university. In addition, a longitudinal study to be carried out on the same sample group in order to see the differences between grade levels can give more specific results in terms of evaluating the differentiation between the acquisitions and grade levels.

Besides all this, in a recent study examining the moderator role of cognitive flexibility, it was found that cognitive flexibility was associated with social intelligence and decision-making styles. It has been found that the effect of social intelligence on decision-making styles increases when cognitive flexibility is high (Karamanlıoğlu & Basım, 2022). In other recent study, cognitive flexibility demonstrated a significant moderating effect on the relationship between stress and psychological symptoms (Bozorgi Kazerooni & Gholamipour, 2023).

CONCLUSION AND RECOMMENDATIONS

In line with the findings of the study, the following recommendations can be made: This research, which is focused on social interest and cognitive flexibility, is a cross-sectional study using the correlational survey model. In the research, it was concluded

that as age increases, social interest increases cognitive flexibility in the relationship between social interest and cognitive flexibility. Longitudinal studies can be conducted in order to see how the changes in individuals' social interest and cognitive flexibility levels maintain over time. Thus, the effect of the age variable on the relationship between these two variables can be examined more clearly.

In this study, the departments of which moderation effect was examined on the relationship between social interest and cognitive flexibility levels were limited to education faculty students on the grounds that the easily accessible sampling method was preferred. More comprehensive studies can be conducted involving different faculties or teaching levels. In line with the result of this research there is a positive and significant relationship at medium level between students' social interest and cognitive flexibility levels; interdisciplinary studies, in which individual differences are closely followed by psychological counselors, teachers and school administrators, can be conducted and course contents that prepare the individual not only academically but also for life as a whole can be prepared. Adler emphasizes that school environment provides a great opportunity for the development of social interest in the individual. Social, cultural, scientific and artistic programs can be developed in which healthy bonds will be established between school, family and children.

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Statements of publication ethics

We hereby declare that the study has not unethical issues and that research and publication ethics have been observed carefully.

Researchers' contribution rate

The study was conducted and reported with equal collaboration of the researchers.

Ethics Committee Approval Information

This study was completed in accordance with the Helsinki Declaration. In line with this, the study was permitted by Gazi University- Assessment and Evaluation Ethics Sub-Study Group

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