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# Investigation of the Factors Affecting the Academic Resilience of Economically Disadvantaged High School Students *

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## Abstract

The main aim of this study was to investigate whether certain variables namely school attachment, perceived social support, cognitive flexibility and gender can predict the resilience of senior high school students that are economically disadvantaged. Another aim of the research is to reveal the relation between the level of academic resilience and gender variable. This study also seeks to examine the differences between academically resilient students with different levels of resilience in terms of the stated variables. For these purposes, a quantitative research method, a correlational research model, was used. The participants consisted of 304 senior students enrolled in 18 Anatolian High Schools during the 2014-2015 academic year in the three districts of the Ankara province, Turkey. Data was collected using 'the Resilience Scale for Adults', 'School Attachment Scale for Children and Adolescents', 'the Multidimensional Scale of Perceived Social Support', 'Cognitive Flexibility Inventory' and the student information form which was designed by the authors. To analyze the collected data, a Standard Multi Regression Analysis, a Multivariate Analysis of Variance (MANOVA) and a Chi-square Test were employed. The results of the Multi Regression Analysis revealed that cognitive flexibility and perceived social support significantly predicted the level of academic resilience of economically disadvantaged high school students. However, school attachment was not found to be a significant predictor. The three variables given above accounted for approximately 41% of variance in the resilience scores of the participants. Furthermore, the results obtained from MANOVA showed no difference between students with high and low academic resilience in terms of cognitive flexibility, school attachment and perceived social support. Moreover, there was a significant relationship between the two groups in terms of gender according to the results of the Chi-square Test.

## Keywords

Academic resilience
School attachment
Perceived social support
Cognitive flexibility
Gender

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## Introduction

While some students can reach the future they aspire easier because of the opportunities they have, some students reach a good future harder than the others because they lack these opportunities. Although negative situations termed "risk factors" potentially play an enormous role in shaping the academic lives of students some students are able to have successful academic lives. In literature, these students are called "academically resilient" and those that possess this feature are considered to have "academic resilience" (Martin, 2002). Academic resilience is the academic success built up in spite of risk factors (Alva, 1991; Masten, 1994; Morales & Trotman, 2011; Wang, Haertal, & Walberg, 1994). In other words, academic resilience is achieving academic success and progress in academic life despite having one or several risk factors in life. According to the model (Martin, 2002) which was developed regarding academic resilience, individuals who are self-confident, determined, and organized tend to be academically resilient.

Academic resilience can be considered to be an equivalent of resilience in academic life. Since it was introduced to the field literature in 1970, the concept of resilience has been one of important and interesting concepts which have been studied in social sciences (Luthar, 2006). Resilience is defined as a state of positively accommodating oneself to hardships which are in the past or present (O'Dougherty, Masten, & Narayan, 2013); capacity of successfully enduring and resisting the factors that threaten development and adaptation to life (Masten, 2014). At the same time, resilience is a characteristic of individuals to stay away from negative outcomes such as academic failure, substance addiction, and perpetration despite their being exposed to a major stress or problem (Linquanti, 1992). According to model which Kumpfer (1995) developed within the frame of findings of longitudinal studies, resilience is defined with six main components, which are; hardships, external protective factors, protective factors that rise as a result of interaction between person and environment, internal factors, resiliency process, positive results. The common point in the definitions of resilience is the situation of being exposed to high risk and nevertheless having positive results (Tiet & Huizinga, 2002). In this sense, an individual who succeeds in a low risk situation is not considered to be a resilient. In order for an individual to be considered as "resilient", he/she needs to have a positive result in a situation which involves high risk. For this reason, high risk factors are necessary constituents that are needed to define and understand resilience (Brackenreed, 2010).

Individuals are affected by many risk factors. Risk factors are factors that can prevent an individual to sustain his/her live in a coherent way and they are the hardships that individual goes or gone through in their lives and troublesome experiences (Radke-Yarrow & Sherman, 2002). These risk factors which jeopardize individual's living his/her life and adaptation to life are problems that are around the individual or developed problems or obstacles (Morales, 2008). In this frame, poverty, being abused, being subjected to violence, having low expectations, being psychologically and physically harassed, alcohol or substance addiction, living with only one of the parents, experiencing natural disasters etc. can be considered as examples to risk factors (Masten, 1994; Richardson, Neiger, Jensen, & Kumpfer, 1990; Winfield, 1994). Of these, being economically disadvantaged can be considered the most critical since it may result in several negative situations such as inadequate prenatal care, poor nutrition and low educational status (Brackenreed, 2010).

When considering the situation of in order for an individual to be considered as resilient, the person needs to achieve a positive result despite the high risk, for a person to be considered as an academically resilient, that person needs to have a risk factor in his/her life and needs to have an academic achievement. In this sense, individuals who are economically at a disadvantage, which is a high risk factor, having achieved an academic success despite other risk factors that occur as a result of it, are students who show academic resilience. It has been reported that academically resilient students with this particular risk factor tend to achieve a higher academic success and improve their educational performance more than economically advantaged students (OECD, 2011). This situation brings out the question of which factors play role in academically resilient students' improving their success.

Minimizing or eliminating the negative effects of the disadvantaged economic status and other related risk factors can be achieved by developing protective factors in students' lives that will reduce the negative impact of risk factors on these individuals (Foster, 2013; Masten & Tellegen, 2012). Protective factors are factors which help individuals in problems they face, overcome hardships and troubles and increase successful and positive experiences (Martin, 2002). Protective factors are divided into two as internal and external protective factors. Internal factors are those which contribute to resilience from individual's own characteristics (Foster, 2013). Self-confidence, self-respect, being ambitious, flexibility, determination, curiosity, problem solving skill, social competence, having high expectations and sense of responsibility regarding future, communication skill, internal locus of control, sense of humor, autonomy, faith in self towards making it by their own etc. can be given as examples regarding internal factors (Benard, 2004; Kumpfer, 1995; Masten, 1994; Werner, 1990). As resilience develops in interactions between individual and environment, the other protective factors are external/ environmental protective factors. External protective factors can be lined up as; attention and inspiring speeches given to individual by parents and relatives, their directing the individual logically, giving chances to individual to develop his/her self-confidence and self-respect, environment's and society's being educated, quality schools, education services, support units and preventive programs, opportunities that environment and society offer, teacher's attention, supplementary contribution, education in small classes, individual's having environments in which he/she can feel secure (Benard, 2004; Masten, 1994; Stafford, Moore, Foggett, Kemp, & Hazell, 2007; Wang et al., 1994; Winfield, 1994) .

According to Martin (2002), academic resilience of students can be improved by increasing these protective factors in their lives. To enhance the academic success of economically disadvantaged students, it is important to investigate and to describe the possible protective factors that can play an important role in students' academic success. Studies in the related literature have mostly investigated the roles of many protective factors in academic resilience.

In the literature, several internal protective factors have been examined such as; having an empathic understanding, internal locus of control and being hopeful for the future (Gizir, 2004); perceived psychological autonomy (Er, 2009); flexibility (Ginsburg & Jablow, 2006; Kumpfer, 1995); cognitive flexibility and planning skills, executive functions (Acedevo, 2009; Acedevo & Esquivel, 2008; Curtis & Cicchetti, 2003; Herbers et al., 2011; Masten et al., 2012); feeling of attachment, attitude towards learning, attitude towards school and perceived autonomy (Kalender, 2015); giving importance to school subjects (Alva, 1991); internal locus of control, high self-concept (Arnold, 2003); academic optimism (Fallon, 2010); positive reading perception (Hernandez & Cortes, 2011); self-confidence (Gizir, 2004; OECD, 2011); motivation (OECD, 2011); social-emotional competences (Elias & Haynes, 2008).

Besides, in the literature, several external protective factors have been examined such as; support from family, high expectations of family (Arnold, 2003; Er, 2009; Catterall, 1998; Foster, 2013; Gizir, 2004; Werner, 1990; Wolin & Wolin, 1993); perceived social support (Elias, 2009; Gizir, 2004; Wu, Tsang, & Ming, 2012; Wilks, 2008; Williams, 2011) caring relationships with peers and school (Er, 2009; Gizir, 2004); involvement in school activities (Er, 2009; Hernandez & Cortes, 2011); school type (Dinçer & Oral, 2010; Fındık & Kavak, 2013); features of schools, the number of teachers per student, parents being financially supportive to schools, the disciplinary atmosphere in the school (Dinçer & Oral, 2010); districts of schools (Fındık & Kavak, 2013); supportive relationships between the teacher and students (Alva, 1991; Dinçer & Oral, 2010; Dass-Brailsford, 2005; Kalender, 2015); perceived social support (Elias & Haynes, 2008; Foster, 2013); role models in environment and supportive social community (Dass-Brailsford, 2005); received support from school (Archambault, Janosz, Fallu, & Pagani, 2009; Hernandez & Cortes, 2011; Malindi & Machenjedze, 2012); atmosphere in the school, newly acquired knowledge (Kalender, 2015; Maddox & Prinz, 2003; Malindi & Machenjedze, 2012; Morales, 2008).

The review of the literature shows that studies investigating protective factors such as school attachment, perceived social support, cognitive flexibility and gender are limited in number, especially in Turkey. Along with this, it can be stated that in the field literature, studies which are conducted on senior students in high school are limited. As senior high school students are in a transitional period towards higher education, their academic resilience have great importance. Because, being economically disadvantaged might cause individual to have failure in academic life and drop out school (Peng, 1994; Weaver, 2009). For this reason, these students can have the opportunity to change the risk situation that they are in with the success that they would show in their academic life. Determining the ways that students who have this risk factor and show academic resilience to reach success would be beneficial firstly to the students with the same risk situation and to other partners of the education. Therefore, in the current study, these particular protective factors were chosen to determine their roles in the academic success of academically resilient students in Turkey. Putting forward the extent and the role of protective factors that are dealt with in the research on students will provide explanatory information regarding academic resilience. It is also thought that with finding the role of the protective factors out, some information about academic resilience profiles of students in Turkish culture that was not revealed before will be revealed. The reasons for choosing these protective factors are individually explained below.

School attachment indicates what students think about their school, teachers, the school climate and their tendency to participate in school-related activities (OECD, 2003). As school is the only way for economically disadvantaged students to enhance their level of education, it is inevitable for the students who show academic resilience to have a high level of school attachment (Lee, 2009). Studies in the field literature also point out the importance of the atmosphere of the school, teacher- student relations and school on the academic resilience (Er, 2009; Dinçer & Oral, 2010; Dass-Brailsford, 2005; Kalender, 2015; Gizir, 2004; Hernandez & Cortes, 2011; Malindi & Machenjedze, 2012). Economically disadvantaged individual's school attachment is important in protecting the individual from this risk factor and motivating the person for success. Because school takes on task as a bridge for students in risky situations (Ungar & Liebenberg, 2013). In this sense, it is indicated that students who have low academic performance or desire towards in-class and out-of- class events, which are indicators of school attachment, may tend towards dropping school and other problematic behaviours (Archambault et al., 2009). School attachment is a protective factor which improves students' positive life results and prevents negative outcomes (Maddox & Prinz, 2003; Morales, 2008; Malindi & Machenjedze, 2012). This situation is supported by a study which examines senior high school students' perceptions of school, and in this study it is determined that students with families with lower monthly income perceive school as "developer and protector" with regards to the students whose families have a high monthly income (Özdemir, 2012). Upon examining the rates of dropping school and absence not being low (MEB, 2013) in Turkey, the protective factor in question needs to be evaluated within the frame of academic resilience. Since the school creates an atmosphere for economically disadvantaged students to achieve academic success, school attachment can be an important protective factor for academically resilient students.

Perceived social support can motivate students from backgrounds with high risk factors to achieve academic success. Perceived social support is a cognitive evaluation that individual has towards social relations (Kuentzel, 2000). The importance of the contribution of social support perceived by academically resilient students have been emphasized in the studies in the field literature (Elias, 2009; Gizir, 2004; Wu et al., 2012; Wilks, 2008; Williams, 2011). According to the results obtained from these researches, perceived social support contributes to academic resilience of students from variety of class levels and students who have various risk factors. Perceived social support received from teachers (Alva, 1991; Dinçer & Oral, 2010; Dass-Brailsford, 2005; Kalender, 2015), family (Catterall, 1998; Foster, 2013; Werner, 1990; Wolin & Wolin, 1993), friends (Er, 2009; Gizir, 2004) plays a role as a protective factor to students in a risky situation. In this sense, considering both the exam period they are in and the risk factor that economically disadvantaged senior high school students have, it would be important

to analyze the protective factor in question in academic resilience. Therefore, it is necessary to investigate the role of perceived social support in the achievements of academically resilient students.

The other protective factor explored in this study is cognitive flexibility. Cognitive flexibility refers to an individual's "(i) awareness that in any given situation there are options and alternatives available (ii) willingness to be flexible and adapt to the situation, and (iii) self-efficacy in being flexible" (Martin & Rubin, 1995, p. 623). One of the protective factors that contribute to individuals' ability to adapt in the face of negative life experiences is flexibility (Ginsburg & Jablow, 2006; Kumpfer, 1995). Studies conducted show that cognitive flexibility is a positive feature that helps the individual in case of negative life conditions (Fresco, Rytwinski, & Craighead, 2007; Leary & DeRosier, 2012). Cognitively flexible individuals believe that their effort will bring them success, and evaluate different aspects and ways to have a solution for the problems they face (Bilgin, 2009). Individuals who have cognitive flexibility believe that hard problems have more than one solution (Dennis & Vander Wal, 2010). While not having encountered to a study that analyses the relation between cognitive flexibility in Turkish culture and academic resilience, there are studies which positively associate academic resilience with cognitive flexibility in the field literature (Acedevo, 2009; Acedevo & Esquivel, 2008; Curtis & Cicchetti, 2003; Herbers et al., 2011; Masten et al., 2012). Because this protective factor studied in a limited number, it is thought that cognitive flexibility of students who show academic resilience should be put forward. In this sense, cognitive flexibility can be a characteristic possessed by many academically resilient students and should be investigated in detail.

Gender also plays an essential part in the development of academic resilience (Kumpfer, 1995). It also has an effect on whether the individual possesses and utilizes protective factors (Çelik, 2013; Wasonga, 2002; Wasonga, Christman, & Kilmer, 2003). Gender's having significant effects on academic life (OECD, 2014; Sarıer, 2010), and girls' generally having a more successful performance than the boys have been revealed by many studies (OECD, 2012; Raty & Kasanen, 2013; Şeker, Çınar, & Özkaya, 2004; Wu et al., 2012). Along with this, gender of the individuals who have risk factor plays an important role in the state of showing academic resilience (Kumpfer, 1995; Raty & Kasanen, 2013). The role of the gender has been examined in many academic resilience studies in the field literature (Dinçer & Oral, 2010; Çelik, 2013; Fındık & Kavak, 2013; Kumpfer, 1995; Morales, 2008; Thorton, Collins, & Daugherty, 2006; Wasonga, 2002; Wu et al., 2012). Based on these studies, gender has been added to the study as it also contributes to the field literature in Turkey.

Putting forward the differences between economically disadvantaged students who show high academic resilience and low academic resilience is an important issue for concerned education partners who want to reduce the number of students who could not show academic resilience. For this reason, ways for students to reach academic success need to be studied in content of protective factors. It is believed that this research, which will reveal these differences through school attachment, protective factors such as perceived social support and cognitive flexibility, and gender will provide information. Studies to be conducted on academic resilience on one hand can put students to forefront more in increasing student's success; on the other hand, they can contribute to enrich the perspective of scientific field of educational measurement and evaluation, educational psychology toward student success. Along with this, studies, which focus on the concept of academic resilience, by revealing how valuable the students who show academic resilience are, an awareness of academic resilience will be developed in school environment and family, as these researches are understood by education partners.

Considering the importance of academic resilience in education especially in Turkey, there is a need to conduct relevant studies. Turkey is one of the countries in which a great number of students who show academic resilience (OECD, 2014). Among the OECD members, although Turkey has the lowest rate of budget reserved to education (Akar, 2014), the percentage of academic resilient students over total student population in Turkey is 7.2, which is higher than the OECD average (6.4 %) (OECD, 2013). However, studies on this issue in the domestic literature are very limited in number. On the other hand, the Turkish education system has long been investing in scholastic materials, teacher education, exams for student selection and placement, renovation of curriculums and textbooks to enhance the

academic success of students; however, students who are the core of the education system are often neglected. Education stakeholders are not paying sufficient attention to the investigation of ways of increasing the academic success of students and how to initiate measures to ameliorate the risk factors potentially faced by students.

It is clear from the reasons explained above that studies should be conducted to explore academic resilience in Turkey. These studies will bring the students to forefront to enhance their academic success and to enrich certain aspects of academic success within the field of assessment and evaluation. These studies are particularly beneficial if conducted with high school students who are in a period of transition to higher education. In this context, the current study investigated the following research questions: (1) Are school attachment, perceived social support, and cognitive flexibility predictors of the resilience of academically resilient students?; (2) Is there a significant difference between academically resilient students in terms of school attachment, perceived support and cognitive flexibility according to different levels of academic resilience?; (3) Is there a significant relationship between the level of academic resilience and gender?

## Method

### *Research Model*

A correlational research model (Lodico, Spaulding, & Voegtle, 2006) was used in this study.

### *Participants*

The participants of this study consisted of a total of 304 academically resilient students. The participants were divided into two groups according to their level of academic resilience. Forming these groups according to their academic resilience levels was concluded with three stages. In the first stage, a variety of students in terms of economic status and academic success were chosen from the senior high school students enrolled in high schools in three districts of Ankara province, Turkey. The criterion used for selecting the districts was done according to the indicator of socio-economic development. In this context, the districts were chosen from groups which had high, medium and low socio-economic levels. The criterion used for this was the base points of the Placement Test for Secondary Education (SBS-Seviye Belirleme Sınavı) of high schools in these districts. Eighteen high schools three with the highest and three with the lowest base points from each district were chosen for the study. As a result, a total of 1019 senior high school students whose age differed between 16 and 18 were recruited from these schools. Table 1 presents the distribution of senior high school students according to districts and schools.

**Table 1.** The Distribution of Senior High School Students According to Districts

| Districts | Gender | | Total |
|---|---|---|---|
| | Girls | Boys | |
| High SES | 162 | 173 | 335 |
| Medium SES | 190 | 154 | 344 |
| Low SES | 181 | 159 | 342 |
| Total | 533 | 486 | 1019 |

In the second stage, to determine the students with risk factors, first economically disadvantaged students were selected. This selection was made according to the poverty line reported by Türk-İş (2014). Therefrom, students whose income per household member was the same as or lower than the poverty line were considered economically disadvantaged.

In the third stage, economically disadvantaged students were divided into two groups according to their cumulative grade point average (CGPA) calculated from the last six semesters. The students were first sorted from the highest CGPA to the lowest CGPA, and the upper and lower 27 % groups were determined. Then, students in the upper 27 % group were categorized as students with high academic resilience and those in the lower 27 % group were classified as students with low academic resilience. This is because in this study being academically resilient is considered having academic success despite being economically disadvantaged. Table 2 presents the statistics of students in the classified groups.

**Table 2.** The Number and Features of Senior High School Students in Terms of Academic Resilience Levels

| Academic Resilience Level | Gender | | Number of Students | The Cumulative Grade Point Average | The Average of Resilience Scores |
|---|---|---|---|---|---|
| | Female | Male | | | |
| High | 101 | 51 | 152 | 87.51 | 124.78 |
| Low | 60 | 92 | 152 | 67.47 | 118.34 |

In terms of the average resilience scores of the groups (Table 2), there was a significant difference between the two groups. Students with high academic resilience had significantly higher resilience scores than students with low academic resilience ($t_{(293)}$=3.31, p<.05). This result validated the classification according to the levels of academic resilience in the study.

***Data Collection Tools***

Data was gathered during the fall semester of the 2014-2015 academic year. Required permissions in order to collect data from Ankara Provincial Directorate for National Education and also to determine the convenience of means of data collection to codes of conduct were obtained from Ankara University Ethics Committee. Data collection tools were filled out by students in 15-20 minutes in a single session. One research assistant and one teacher were present in the classrooms during the procedure of the data collection. The following data collection tools were used.

*Information form:* This form developed by authors was used to collect personal information about students such as gender, cumulative grade point average, and education status of parents, household income and the number of household members.

*Resilience Scale for Adults:* This scale was developed by Friborg, Hjemdal, Rosenvinge, and Martinussen (2003) in order to measure the resilience of individuals and was adapted into Turkish culture by Basım and Çetin (2011). It is a 5-point Likert scale with 33 items categorized under six factors namely 'perception of self', 'perception of future', 'structured style', 'social competence', 'family cohesion' and 'social resources'. Obtaining a high score from the scale indicates a high level of resilience and vice versa. The study of developing the scale was conducted on 235 people emphasizing that the target sample was 18-75 age range while the study of adaptation to Turkish was conducted on two groups which composed of 350 university students and 262 employees.

The reason why this scale is used in this study is because resilience scales were compared by Ahern, Kiehl, Sole, and Byers (2006) and as a result, this scale received the highest points from all criteria which were determined by researchers. Another reason is that this scale being adapted into Turkish culture; and it is the only scale that embraces all dimensions of resilience while considering environmental conditions (Basım & Cetin, 2011). Whether this scale was convenient to this study which was carried on senior high school students was analysed by confirmatory factor analysis (CFA), which was made on another data apart from the research data. With CFA, it was determined whether the

model which was already put forward in a culture will function in another group or not, evaluation of the validity of the structure and whether it can be applied in a different group or not (Brown, 2006).

The fit of the factor structure of the scale on the data of the study was analyzed performing CFA. According to certain fit indexes, $x^2$=1870.27 (N=693, sd=457, p=.000), $x^2$/sd=4. 09, RMSEA=. 06, RMR=. 10, SRMR=. 08, GFI=. 86, AGFI=. 80, the six-factor structure of the scale fitted to the data of the study. The results of Cronbach's Alfa Reliability Coefficients demonstrated that the reliability for each factor, 'perception of self', 'perception of future', 'structured style', 'social competence', 'family cohesion' and 'social resources', was .68, .67, .56, .67, .61, .67, respectively with the overall reliability being .85. According to these findings, the validity and reliability of the scale was acceptable for the data of the study. For this reason, using the scale in this study is considered to be appropriate.

*School Attachment Scale:* This scale was developed by Hill and Werner (2006) in order to measure the school attachment levels of children and adolescents and was adapted into Turkish culture by Savi (2011). It is a 5-point Likert scale with 13 items under the following three factors: 'teacher attachment', 'peer attachment', and 'school attachment'. A high score from the scale indicates a high level of school attachment and vice versa. The study of developing the scale was conducted on 834 students who were 3rd and 12th grade students, and the study of adaptation to Turkish conducted on 702 primary school students. The reason for this scale to be used in this study is because it analyses school attachment with regards to attachment to teacher and friend in its sub-factors and it has high validity and reliability values. The fitness of the factor structure of the scale to the data collected in the study was evaluated using CFA. According to certain fit indexes, $x^2$=242.14 (N=450, sd=62, p=.000), $x^2$/sd=3. 91, RMSEA=. 08, RMR=. 06, SRMR=. 05, GFI=. 92, AGFI=. 89, the three-factor structure of the scale fitted the data of the study. The results obtained from Cronbach's Alfa Reliability Coefficients demonstrated that the reliability values for 'teacher attachment', 'peer attachment', and 'school attachment' were .91, .86, .87, respectively, with the overall reliability being .89. Based on these findings, the validity and reliability of the scale was acceptable for the data of the study. For this reason, using the scale in this study is considered to be appropriate.

*Multidimensional Scale of Perceived Social Support:* This scale was developed by Zimet, Dahlem, Zimet, and Farley (1988) in order to measure the level of perceived social support in individuals and was adapted into Turkish culture by Eker, Arkar, and Yaldız (2001). It is a 7-point Likert scale with 12 items and three factors namely 'family', 'friend', and 'special person'. Obtaining a high score from the scale indicates a high level of perceived social support and vice versa. The study of developing the scale was conducted on 272 university students whose age range was between 17 and 22; while the study of adaptation to Turkish was conducted on a group which consisted of 150 people, and whose average of age was 35.

The reason why this scale is used in this study is scale's involving more than one dimension of social support, its being functioned in several cultures and qualified and short, and in addition, as Eker et al. (2001) emphasises; it can be generalized in Turkish culture. The first form of the scale was firstly applied on 146 university students by Eker and Arkar (1995), and later on the structure which was obtained was tested in other sample. The revised form of the scale (Eker et al., 2001) was structured in a different sample than student group. In order to analyze whether the factor structure of the scale fitted the data of the study, CFA was employed. According to the following fit indexes, $x^2$=229.37 (N=561, sd=51, p=.000), $x^2$/sd=4. 5, RMSEA=. 08, RMR=. 04, SRMR=. 03, GFI=. 93, AGFI=. 89, the three-factor structure of the scale fitted the data of the study. The results from Cronbach's Alfa Reliability Coefficients showed that the reliability values for 'family', 'friend', and 'special person' were .88, .95, .88, respectively, with the overall reliability of the scale being .87. According to these findings, the validity and reliability values of the scale in relation to the data of the study were acceptable. For this reason, using the scale in this study is considered to be appropriate.

*Cognitive Flexibility Inventory*: This inventory was developed by Dennis and Vander Wal (2010) in order to measure the cognitive flexibility of individuals and was adapted into Turkish culture by Gülüm and Dağ (2012). The inventory consists of 20 items with two factors namely 'alternatives' and 'control'. A higher score from the scale means a higher level of perceived social support and vice versa. Statistical analyses had previously been conducted on the total score obtained from the original and Turkish form of the inventory. The same procedure was followed in this study. The study of developing BEE was conducted on 196 university students whose age differed between 19 and 21, and the study of adaptation to Turkish was conducted on 266 university students.

The reason why this scale is used in this study is as Gülüm and Dağ (2012) points out, there is another cognitive flexibility scale that was adapted into Turkish culture. However, the related scale while focusing on individual's communication competencies, it "does not measure the cognitive flexibility as it is stated in behavioral approach" (p. 217). Together with this, BEE on the other hand considering hardships to be taken under control, aims to measure the feature (Dennis & Vander Wal, 2010) of believing to reach more than one solutions and in this case there could be multiple alternative interpretations/ explanations. In this sense, BEE focuses on psychological structures which can be related to academic resilience.

In order to analyze whether the factor structure of the inventory fitted the data of the current study fitted, CFA was employed. According to the fit indexes of $x^2$=598.48, (N=450, sd=168, p= .000), $x^2$/sd=3. 54, RMSEA=. 07, RMR=. 06, SRMR=. 07, GFI=. 88, AGFI=. 85, the two-factor structure of the inventory fitted the data of the study. The results obtained from Cronbach's Alfa Reliability Coefficients demonstrated that the reliability values for each factor, namely 'alternatives' and 'control', were .82 and .87, respectively, and the overall reliability of the inventory was .87. Based on these findings, the inventory was found to be valid and reliable for the use with the data of the study. For this reason, using the scale in this study is considered to be appropriate.

***Analysis of Data***

To analyze the collected data, a Standard Multi Regression Analysis and a Multivariate Analysis of Variance (MANOVA), and a Chi-square Test were used. In these analyses, the significance level was accepted as .05 and SPSS 20.0 software was used. The dependent predictor variable, resilience, was coded as RESIL, and independent predictor variables namely school attachment, perceived social support and cognitive flexibility were coded as SCHOOL, SOCIAL and FLEX, respectively.

After checking outliers in the dataset, nine values were distracted from the data set. Multi-linearity and multi-normality were examined using a P-P chart and a histogram and the assumptions were confirmed. Moreover, multicollinearity, the auto-correlation of residuals in the regression analysis, were examined and stated assumptions were confirmed.

The other two assumptions of MANOVA are covariance matrix and error variance homogeneity (Tabachnick & Fidell, 1996). The covariance matrix homogeneity was examined using Box's Test and found homogenous (Box's M=9. 62, p>0.05). In addition, the error variance homogeneity was investigated using Levene's Test. The results showed that, except the FLEX ($F_{(1,293)}$=8.70, p<0.05) variable, the error variance of all other variables was homogenous. According to Tabachnick and Fidell (1996), if the compared groups are similar to each other in term of size, the assumption of error variance can be avoided. Since, in the current study, the size of the student groups was similar (149-146), this assumption was avoided. All assumptions of the Chi-Square Test were checked and confirmed.

## Results

***Results Regarding the Predictors of Resilience of Academically Resilient Students***

Table 3 presents the descriptive statistics (average, standard deviation and variation coefficient) of independent variables and Table 4 shows the results of the standard multi-regression analysis.

**Table 3.** Descriptive Statistics of Independent Variables' Scores (N=146)

| Independent Variables | $\bar{X}$ | $SD$ | V (%) |
|---|---|---|---|
| SCHOOL | 44.54 | 9.03 | 20.27 |
| SOCIAL | 44.95 | 8.55 | 19.02 |
| FLEX | 75.97 | 10.23 | 13.47 |

The analysis of the variation coefficients (Table 4) indicates that the related values are lower than the threshold value, which is 50%. This means that the number of students with high academic resilience is homogeneous over the independent variables.

**Table 4.** Results of Standard Multi-Regression Analysis

| Variable | B | $SE_B$ | $\beta$ | t | p | Partial r | Part r |
|---|---|---|---|---|---|---|---|
| Constant | 41.45 | 8.55 | - | 4.85 | 0.00 | | |
| SCHOOL | 0.01 | 0.13 | 0.06 | 0.83 | 0.93 | .007 | .005 |
| SOCIAL | 0.62 | 0.13 | 0.34 | 4.68 | 0.00 | .37 | .30 |
| FLEX | 0.72 | 0.11 | 0.47 | 6.81 | 0.00 | .50 | .44 |

R=0.64 $R^2$=0.41 $F_{(3,142)}$=33.14 p=0.001

Table 4 demonstrates that there is a low positive relationship between resilience and SCHOOL ($r = .007$); however, when the other variables are kept constant, this relationship is reduced to $r = .005$. Furthermore, there is a moderate positive relationship between resilience and SOCIAL ($r = .37$), and between resilience and FLEX ($r = .50$) but when the other variables are kept constant, the relationship values were reduced to $r = .30$ and $r = .44$, respectively. According to the standardized regression coefficients ($\beta$), the rank of importance in terms of predicting resilience was FLEX (0.47) followed by SOCIAL (0.34) and SCHOOL (0.06). The results of the t - test which was conducted to test the significance of regression coefficients showed that SOCIAL and FLEX variables were significant predictors of resilience whereas SCHOOL was not. The SCHOOL, SOCIAL and FLEX variables explain approximately 41 % of the total variance of resilience of students with high academic resilience (R=0. 64, $R^2$=0.41 and p<.05).

***Results Regarding Differences between Students with High and Low Academic Resilience***

Table 5 presents the descriptive statistics on dependent variables according to the scores of resilient students with different levels of academic resilience.

**Table 5.** Descriptive Statistics of Dependent Variables' Scores

| Dependent Variables | Academic Resilience Level | N | $\bar{X}$ | $SD$ |
|---|---|---|---|---|
| SCHOOL | High | 146 | 44.54 | 10.23 |
| | Low | 149 | 43.87 | 9.04 |
| SOCIAL | High | 146 | 44.95 | 8.55 |
| | Low | 149 | 45.11 | 9.50 |
| FLEX | High | 146 | 75.97 | 10.23 |
| | Low | 149 | 73.23 | 12.17 |

As shown in Table 5, the average scores of the two student groups in terms of dependent variables were very close. MANOVA was employed to identify the statistical differences between the two groups in terms of the dependent variable scores. According to the results, there is no significant difference between the two groups in terms of SCHOOL, SOCIAL, and FLEX variables ($Pillai's\ Trace\ (V) = 0.16,\ F_{(3-291)}$=1.60, p>.05).

***Results Regarding the Level of Academic Resilience and the Gender***

Table 6 presents the results of the Chi-Square Test conducted to explore the relationship between the level of academic resilience and gender.

**Table 6.** Results of Chi-Square Test

| Academic Resilience Level | | Gender | | Total |
|---|---|---|---|---|
| | | Female | Male | |
| High | N | 98 | 48 | 157 |
| | % | 33.2 | 20 | 53.2 |
| Low | N | 59 | 90 | 138 |
| | % | 16.3 | 30.5 | 46.8 |
| Total | N | 146 | 149 | 295 |
| | % | 49.5 | 50.5 | 100 |

$x^2 = 22.44$ sd=1 p=.001

As shown in Table 6, there is a significant relationship between the level of academic resilience and gender ($x^2 = 22.44$, p<.05). Furthermore, of the total 53.2 % of students with high academic resilience, 33.2 % were female whereas only 20 % were male. In the low academic resilience group, the percentage of female and male student were 16.3 % and 30.5 %, respectively. Therefore, it can be concluded that female students had a higher level of academic resilience than male students. The power of the relationship between the level of academic resilience and gender was calculated as $\varphi = .28$, which indicates a low level of relationship.

## Discussion, Conclusion and Suggestions

The regression analysis used to find an answer to the first research question revealed that cognitive flexibility is one of the uttermost predictor of the resilience in this study. This can be attributed to the students with high level of cognitive flexibility being able to find solutions for problems and believing that they will be successful if they make enough efforts, which is also supported by Bilgin (2009). Similarly, the limited number of studies related to cognitive flexibility and academic resilience demonstrated a positive relationship between these variables. These studies were conducted with different sample groups and scales but show parallel findings (Acedevo, 2009; Acedevo & Esquivel, 2008; Curtis & Cicchetti, 2003; Herbers et al., 2011; Masten et al., 2012). The reason why cognitive flexibility predicts the resilience of academically resilient students can be related with the age of students. Furthermore, it has been reported that there is a positive relationship between students' cognitive flexibility and age (Altunkol, 2011). With the increasing age, the student encounters new environments where they can develop their cognitive skills (Best, Miller, & Jones, 2009). Therefore, the age can have an effect on improving the level of cognitive skills thus the cognitive flexibility of students. According to Acedevo (2009), students who show high academic resilience also have high cognitive flexibility and their cognitive flexibility predicts their academic success. For this reason, it is suggested to put emphasis on cognitive flexibility in enhancing academic resilience in students. Based on this positive relation between cognitive flexibility and academic resilience, activities can be undertaken that will increase the cognitive flexibility in learning environments or schools for students with risk factors to enhance their academic resilience. In addition, creating platforms with problem situations which encourages students to develop cognitive skills and ways of thinking to find different solutions would be advantageous for these students. In this context, teachers preparing lesson-activities according to real-life situations and complicated problems could have a significant effect. Adding gains in which

students encounter with problem situations with multiple ways of solution to the curriculum can be suggested to the Ministry of Education. With these kinds of gains, students can find a chance to improve their cognitive flexibility and they can use the thought system that cognitive flexibility requires.

Perceived social support is another predictor variable of resilience in students with high academic resilience in this study. This means that perceived social support might play as a protective factor in these students' lives. Studies in the literature reported similar results and conclusions (Elias & Haynes, 2008; Arastaman, 2011; Er, 2009; Foster, 2013; Wu et al., 2012). Even though these studies were not directly conducted on the perceived social support of academically resilient students, they suggested a connection between academic success and resilience and therefore their results are in agreement with those obtained from the current study.

Perceived social support from family and teacher of students has a positive effect on the academic success of high school students (Ateş, 2012; Ahmed, Minnaert, Van der Werf, & Kuyper, 2010; Ryabov, 2011). Particularly those with risk factors (Nettles, Mucherach, & Jones, 2000; Williams, 2011). Considering the risk factor of economically disadvantaged students together with the compelling preparation for the Undergraduate Placement Examination (YGS-Yükseköğretime Geçiş Sınavı), the importance of perceived social support in academic resilience is undeniable. In this period, social support perceived by students from their teachers, peers and families has a significant role. Social support that students receive from stated resources in the field literature is also seen as important in students' academic resilience (Alva, 1991; Dinçer & Oral, 2010; Dass-Brailsford, 2005; Kalender, 2015; Catterall, 1998; Foster, 2013; Werner, 1990; Wolin & Wolin, 1993). Therefore, it would be beneficial to further enhance the perceived social support of these students by getting them to effectively interact with social environments and community and to create an atmosphere in which teachers and school principals can help them improve their perception of social support. For example, informative meetings and seminars can be organized for parents and teachers of senior high school students who have risk factors in their lives with regards to increase the social support that students perceive. These students who are specifically in the process of preparing for transition to higher education examination, programmes that will enhance the social and emotional ability of those people who students spend most time with can be suggested.

In the study, school attachment did not significantly predict the level of resilience in students with high academic resilience. This result is not in agreement with the results of other studies (Er, 2009; Dinçer & Oral, 2010; Dass-Brailsford, 2005; Kalender, 2015; Gizir, 2004; Hernandez & Cortes, 2011; Malindi & Machenjedze, 2012). In the literature, school attachment has been reported to act as an alternative protective factor in the absence of other protective factors (Benard, 2004). For instance, according to the results of a 5-year longitudinal study, school attachment was even more powerful than family bonding since the students' perception of school was positive and rewarding (Sale & Springer, 2001). Furthermore, it has been shown that school attachment enhances academic success (Maddox & Prinz, 2003; OECD, 2003), and students with high academic resilience were found to have a high level of school attachment (Fallon, 2010; Malindi & Machenjedze, 2012). The difference between the results of the current study and those from the literature can be attributed to the age of students. According to Benard (2004), the effect of school attachment as a protective factor is reduced by the increase in age. Similarly, another study conducted in Turkey found the same result (Bellici, 2015). Since participants of the current study were students aged between 16 and 18 years, their school attachment may have been lower. The fact that senior high school students in Turkey are preparing for university admission tests might be effective in this situation. It has been reported that as high school students moved up through the grade levels, their interest in lessons got lower (Kumandaş & Kutlu, 2014). Along with this, in another study (Özdemir, 2012), it is determined that senior high school students perceive school to be a place with more pressure than other students. In this frame, comparisons to be made between school attachment variance and class level of students who show academic resilience would be beneficial. Curative applications conducted by education partners are also significant to develop school attachment among students. For this reason, based on findings gathered from students with low level of school

attachment, it can be suggested that precautions should be taken against factors that negatively influence school attachment.

The results of the second research question showed no significant difference between students with high and low academic resilience in terms of cognitive flexibility, school attachment and perceived social support. This result is also not parallel to those obtained from other studies in the international literature (Acedevo, 2009; Acedevo & Esquivel, 2008; Alva, 1991; Arastaman, 2011; Foster 2013; Gonzalez & Padilla, 1997; OECD, 2011; Perez, Espinoza, Ramos, Coronado, & Cortes, 2009; Wu et al., 2012). This can be attributed to cultural differences since these studies were conducted with students from different backgrounds and ethnicities. Along with this, perceived social support and school attachment from these stated variables may cause the same effect to all senior high school students regardless of their level of academic resilience.

Another reason why no significant difference was found between the two groups in terms of the variables could be the criterion used to select students with academic resilience. In Turkey, the high importance that the student's grade point average has in the overall score of the higher education placement test places undue pressure on students and the school and particularly on the teachers. (TED, 2008). In order to eliminate and lessen this pressure, teachers tend to give students higher marks resulting in an increase in their grade point averages. Therefore, "using incomparable grade point averages in important decisions regarding students cause inequality" (TED, 2010). For this reason, the classification of academic resilience according to the grade point average may not have been sufficient to demonstrate the real difference between these groups. For situation like this, more explanatory information can be brought to this situation with studies that would be conducted based on standard achievement tests. However, standard tests' not being used in Turkey makes it harder.

Based on the results of third research question, it can be concluded that female students are generally more successful in education and tend to have higher academic resilience than male students. There are many studies supporting this conclusion. This finding is being supported by other studies in the field literature as well (Dinçer & Oral, 2010; Çelik, 2013; Fındık & Kavak, 2013; Kumpfer, 1995; Morales, 2008; Thorton et al., 2006; Wasonga, 2002; Wu et al., 2012). Gender impels other variables that would contribute to academic resilience. For this reason, gender has been considered to be an important factor in the field literature (Çelik, 2013; Wasonga et al., 2003) for it varies by gender to reach external protective factors and to benefit from them. Female students take advantage from external factors more and this situation causes a discrepancy in academic resilience of the students (Wasonga, 2002).

In recent years, the educational policies towards the goal of promoting schooling have resulted in more children being enrolled in school programs (Çelik & Gür, 2013). Moreover, Turkey's transition to compulsory eight-year education and campaigns (i.e. Let's go to school, girls! (Haydi Kızlar Okula!) regarding the schooling of female students has led to an increase in female students attending school (Gümüş & Gümüş, 2013). As the study is conducted in Ankara province, and considering the fact that according to the report of the Economic Policy Research Foundation of Turkey (TEPAV) Ankara is the most successful province in rate of girls in high school education (Demirdirek & Şener, 2014), the number of female students participated in the research being high might bring out the related result of the study. In the light of these results, future qualitative studies can be conducted with female students having highly academic resilience to explore how female students develop academic resilience. This can reveal the protective factors had by female students. The results can also be beneficial to male students that are not as academically resilient as female students. Moreover, it would be very important to create environments in schools and families in order to further enhance protective factors of girls who tend to have academic resilience, especially in a country like Turkey, which has difficulties and unsolved problems regarding schooling of girls (Çelik & Gür, 2013; Gümüş & Gümüş, 2013).

This study has several limitations and therefore, the findings should be evaluated in the context of study limitations. Firstly, participants of the study involves students from three districts in Ankara, thus this situation may affect the generalizability. Future studies can be conducted with large samples of academically resilient students. Another limitation is the usage of academic achievement indicator that is gathered from teacher-made tests and income in selecting academically resilient students. Moreover, some other criteria could be utilized while selecting academically resilient students in future studies. One of the criteria would be students who show academic resilience are being picked by their lecture teachers or school counsellors. Especially school counsellors can specify academically resilient students since they know the problems that students face in their social life and their academic performances in the school.

It can be accepted as another limitation to only include one variable (cognitive flexibility) from internal factors which affect academic resilience of students, and two variables (school attachment, perceived social support) from external factors to the study. In this sense, in future studies information about protective factors which play a role in students' academic resilience might be obtained with different scales and applications. For this purpose, studies based on common standard indicators can be carried out for all countries in the large-scale assessments that determine international student success such as Programme for International Student Assessment-[PISA], Trends in International Mathematics and Science Study-TIMMS] and Progress in International Reading Literacy Study-[PIRLS]. Thus, studies based on comparing Turkey to other countries can be conducted. At the same time, studies can also be conducted on the applications of these large-scale assessments in different years. Along with this, in this research, being economically disadvantaged is examined as a risk factor that students have. Conducting future studies also with academically resilient students who have separated parents, experienced a serious or fatal illness, living without parents, is thought to be important to understand the protective factors that affect both the academic resilience and the academic lives of these students and for students with the same risk factors.

Despite all these limitations, this study, which is conducted regarding students who show academic resilience, will provide field literature with regards to its demonstrating features of students. Together with this, it is thought that this study, in which discussions on the differences between students who show high academic resilience and students who show lower academic resilience are stated in a particular frame, offers beneficial information especially to the field literature in Turkey.

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