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# The mediating role of 21st century skills in the relationship between future orientation and career anxiety[1]

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**Abstract**

The aim of this study is to reveal the mediating role of 21st century skills in the relationship between future orientation and career anxiety of high school students. The research was designed with the relational screening model, which is one of the quantitative research methods. 589 students participated in the research in which maximum variation sampling method was used. As the data collection tool in the research; "Personal Information Form", "Multidimensional 21st Century Skills Scale", "Future Visions Scale" and "Career Anxiety Scale" were used. In the study, Pearson Product Moment Correlation was used to examine the relationship between the variables, and structural equation modeling was used to examine the mediating role of 21st century skills. According to the analyzes; it was seen that there was a low level negative relationship between career anxiety and future orientation; a low level negative relationship between career anxiety and 21st century skills and a low level positive relationship between future orientation and 21st century skills. A significant difference was found in terms of gender and school type variables in future orientation, career anxiety and 21st century skills of high school students, and in terms of grade level variable in career anxiety. As a result of the analysis conducted to test the mediating role of 21st century skills, it was seen that 21st century skills had a partial mediating role in the relationship between future orientation and career anxiety of high school students.

**Keywords:** 21st century skills, Anxiety, Hope, Optimism-pessimism, High school students.

## Introduction

Since the day it came into being, human beings have continued their development journey, made discoveries with the curiosity and passion for learning, and strived to know nature, the world, and the universe. From hunting and gathering to agricultural society, from industrial society to the information age of the 21st century (Çelik, 2021), the needs of individuals have also changed and diversified according to the changing characteristics of the period. While employers who want to meet the changing needs of consumers try to keep their production up to date, employees have also had to constantly renew themselves in line with these changes and developments (Karacan

[1] This study was produced from the researcher's (Bayhan, 2024) master's thesis titled "The Mediating Role of 21st Century Skills in the Relationship between High School Students' Future Orientation and Career Anxiety".

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Özdemir & Ayaz, 2020). With the integration of computer systems into production facilities, human labor has been reduced to a minimum level and “speed” has come to the fore (Koca, 2020). For this reason, it is expected that many professions will completely disappear in the future and 100 million people will be unemployed by 2030 due to developments such as digital technologies and artificial intelligence (Çelik, 2021).

Since the day it came into being, human beings have continued their development journey, made discoveries with the curiosity and passion for learning, and strived to know nature, the world, and the universe. From hunting and gathering to agricultural society, from industrial society to the information age of the 21st century (Çelik, 2021), the needs of individuals have also changed and diversified according to the changing characteristics of the period. While employers who want to meet the changing needs of consumers try to keep their production up to date, employees have also had to constantly renew themselves in line with these changes and developments (Karacan Özdemir & Ayaz, 2020). With the integration of computer systems into production facilities, human labor has been reduced to a minimum level and “speed” has come to the fore (Koca, 2020). For this reason, it is expected that many professions will completely disappear in the future and 100 million people will be unemployed by 2030 due to developments such as digital technologies and artificial intelligence (Çelik, 2021).

In the face of this situation, many organizations have prepared research and reports in order to train individuals suitable for the working conditions demanded by the 21st century; the skills and competence areas needed by the business world have been tried to be revealed with the studies conducted (Çelik, 2021). The skills that individuals preparing for the 21st century business world need to acquire in the process starting from school life and continuing to business life have been classified. Although there are different classifications regarding skills, the common point is that individuals are prepared for the future (Arslan, 2020). These skills, consisting of competencies such as problem solving, entrepreneurship, use of information and communication technologies, effective communication, flexibility, have been expressed as 21st century skills (Can Göl, 2023).

The “Framework for 21st Century Learning (P21 Framework), which has an important place in the theoretical framework regarding 21st century skills, is classified as “Learning and Innovation Skills; Information, Media and Technology Skills and Life and Career Skills” (Soruklu & Şentürk, 2023; Partnership for 21st Century Skills, 2009). Another theoretical framework prepared for 21st century skills, “Assessment and Teaching of 21st Century Skills; ATC21S” was created by Cisco, Intel and Microsoft. The companies mentioned sponsored this project that will research and develop new approaches, methods and technologies in order to evaluate the success of 21st century teaching and learning in classrooms around the world (Erstad, 2010). The researchers grouped the 21st century skills developed by 11 different institutions under four main themes and determined 10 skill types depending on these themes (Binkley et al., 2010). In the theoretical framework prepared by the Organization for Economic Co-operation and Development (OECD), 21st century skills are classified under three headings as cognitive characteristics, cultural and social characteristics and expectations regarding teaching and learning (Ergin & Korucuk, 2021; Türel et al., 2023; Zeybek, 2019). For the learning framework related to these three specified themes, students are also expected to have certain knowledge, skills, attitudes and values (motivation, confidence, diversity and virtue) (Cansoy, 2018). The skills framework prepared by the International Society for Technology in Education (ISTE) has determined seven standards that students should have in order to ensure competencies in learning, teaching and leading with

technology (Soruklu & Şentürk, 2023). These are; empowered learner, digital citizen, knowledge creator, innovative designer, computational thinker, creative communicator, and global collaborator (ISTE, 2017). The education district units in the State of Iowa in the United States have prepared a framework consisting of five different areas for 21st century skills (Cansoy, 2018). In this prepared framework, 21st century skills; employability, financial literacy, health literacy, technology literacy and civic literacy (IowaCore, 2010). When we look at our country in terms of 21st century skills, it is seen that it was first mentioned as "requirements of the new millennium" by the Turkish Industrialists and Businessmen Association (TÜSİAD, 1999) within the scope of a study conducted to "determine the occupational requirements of the new millennium" (Zeybek, 2019). 21st century competency areas were determined by the Ministry of National Education (MEB) in 2017. In this context, the skills to be acquired were addressed under nine different headings and an update study was carried out in the education programs. (TTKB, 2017). It is aimed to provide students with the competencies related to the skills expected to be possessed within the framework of the curriculum (Cansoy, 2018). The Ministry of National Education Board of Education and Training (TTKB) published the "Research Report on 21st Century Skills and Values" in 2023 in order to present a model proposal for 21st century skills. Within the scope of the report, national and international studies, researches and various documents were examined and a classification was made for the 21st century skills that students are expected to gain. After the examination of a total of 616 sources, seven main skills (Social and Emotional Skills, Language and Communication Skills, Higher-Order Thinking Skills, Self-Skills, Learning Skills, Study Skills, Literacy Skills) were determined, 46 sub-skills related to them were defined and named as the "Inclusive 21st Century Skill Model". (Türel et al., 2023).

In addition to the skill frameworks put forward by many organizations in order to train individuals suitable for changing business conditions, young people are trying to make a future plan in line with the requirements of the digital world in a process where competition increases every day (Konate, 2020). The high school years, when future planning begins, are the period when young people in adolescence discover themselves and prepare for a higher education institution, university, or a profession (Yayla, 2023). During this period, the individual sets goals for himself and tries to advance his career process by evaluating the opportunities he has (Akıncı, 2022). Career, which refers to a profession or occupation in which the individual is constantly in the process of learning and developing, contains goals and opportunities within itself. The individual sees the career process in which he progresses in line with a purpose and by giving it meaning as a series of educational experiences (Akıncı, 2022). Many researchers have conducted studies on this subject for years and examined the career development processes of individuals (Şama, 2020). Making a university choice and making a career choice decision can sometimes cause individuals to experience anxiety. The anxiety and worry experienced especially during this career planning process is accepted as career anxiety (Kayadibi & Kırdök, 2020). During the transition to universities, which is a higher level of education, or during the period when they discover their interests, talents and values and prepare for the profession, adolescent individuals who are high school students experience career anxiety due to many reasons (Yayla, 2023). The constantly advancing scientific and technological developments of the 21st century, the change in employer expectations and the differentiation in working conditions cause individuals who are trying to build a life for themselves to experience anxiety and restlessness. (Akça et al., 2018).

Scientists have begun to rethink career theories in order to carry out the career planning process

of the individual in a healthier way (Sevinç & Siyez, 2018). One of these scientists, Savickas and his colleagues, thought that classical career theories were inadequate and developed the Career Construction Theory, which uses Holland's typology theory and Super's developmental periods, for the global employment policies of the 21st century and to be applied in multicultural societies (Sevinç & Siyez, 2018). Savickas and his colleagues prepared the life design approach based on this theory they developed and aimed to meet the needs in the career planning process (Hirschi & Dauwalder, 2015). The life design approach, which is prepared to be preventive against problem situations, allows the individual to intervene in the career construction process when necessary. At this point, the quality of the individual's future orientation is important because an individual with a positive future orientation will also be optimistic and hopeful about his future (Toker & Kalıpçı, 2021). Hope helps people look to the future with hope, to show more happiness, success and resilience; It plays an important role in the individual's creation of their own future vision as a powerful source of motivation. (Ginevra et al., 2020). An individual with hope constantly strives to achieve his goal and the difficulties he encounters do not scare him (Çalışkan & Dilmaç, 2021). He also feels strong in facing stressful situations and overcoming problems (Hagen et al., 2005; Cui et al., 2020). For this reason, hope is very important to cope with the problems brought about by labor markets full of uncertainty (Temurtaş, 2022). When the literature explaining the concepts of optimism and pessimism is examined, it is seen that these two concepts, which have a bipolar structure (Akça at al., 2018) are used together (Ginerva et al., 2017; Scheir et al., 1994; Segerstrom et al., 2017). Pessimists who think that something bad will happen to them are opposed to optimists who think that good things will come to them, and they generally have a positive mindset about their future (Abdullah, 2018; Segerstrom et al., 2017). Scheier et al. (1994) stated that when optimists fail to solve their problems, they use emotionally focused coping strategies such as accepting the situation and making jokes or looking at the problem from different perspectives. Pessimistic individuals, on the other hand, tend to escape mentally and behaviorally by choosing the path of denial and stress in the same problem situation. Pessimistic individuals, who often see the situation much more negatively than it actually is, attribute positive events to factors such as luck (Abdullah, 2018). For this reason, optimists who have good expectations for the future lead more productive lives in many ways and have a higher quality of life. Because optimism enables individuals to be satisfied with their lives (Scheier et al., 1994).

Individuals' hopeless and pessimistic feelings about the future, such as anxiety, fear, and restlessness, prevent them from making positive future plans (Akça et al., 2018). Therefore, it is also very important for individuals to be equipped with 21st-century skills such as problem solving, flexibility, and adaptability, which will enable them to cope with the uncertain situations of the future, instead of negative emotions, because job-specific skills alone are not sufficient in the labor market (Bayley, 2022; Türel at al., 2023). Acquiring 21st-century skills, such as being able to adapt to change, structuring knowledge, and using technology, which are emphasized by many institutions or organizations, will make it easier for them to find a place for themselves in the digital world where artificial intelligence is on the rise (Çelik, 2021).

In line with this information, the aim of the study was to reveal the mediating role of 21st century skills in the relationship between high school students' future orientation and career anxiety. In addition, the research sought answers to the questions; "Is there a significant relationship between high school students' career anxiety scores, future orientation scores and 21st century skills scores?", "Is there a mediating role of 21st century skills in the relationship between high

school students' career anxiety scores and future orientation scores?", "Do high school students' career anxiety scores, future orientation scores and 21st century skills scores differ significantly in terms of gender, grade level and school type?".

## Method

### Research model

This research was designed in the quantitative method and relational screening model. In the relational screening model, which is a type of screening research, the relationships between two or more variables are investigated (Karasar, 2009: 81). In the study, the relationship between future orientation and career anxiety was tried to be revealed through the mediation of 21st century skills. The relational scan to be conducted regarding the variables included in the study is given in Figure 1.

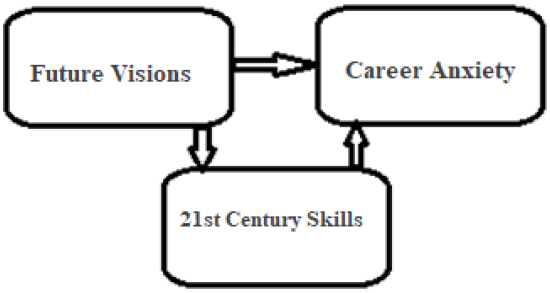


**Figure 1** Relational screening model of the research

### Research group

The research group consisted of high school students studying in the city of Samsun in Turkey. The maximum variation sample was selected as the sampling method of the study. Büyüköztürk and the others (2022:93) define the maximum sampling method as explaining the problem with a broader perspective by determining similar or different aspects and patterns between different situations in a way that is consistent with whatever is aimed in the research. In this direction, five different school types were included in the research in the Samsun universe, namely Science High School, Anatolian High School, Vocational High School, Imam-Hatip High School and Social Sciences High School. These schools, which have girls and boys, accept students with or without exams, provide formal education and have students from almost every socio-economic level, were selected as the maximum variation sample. In this direction, data was collected randomly from 589 students. The distribution and percentage values regarding the demographic information of the participants are shown in Table 1.

**Table 1** Demographic characteristics of the participating

| Variable | Sub variable | f | % |
|---|---|---|---|
| Gender | Male | 263 | 44.7 |
| | Female | 326 | 55.3 |
| School Type | Science high school | 113 | 19.2 |
| | Social sciences high school | 108 | 18.3 |
| | Vocational high school | 125 | 21.2 |
| | Imam-hatip high school | 121 | 20.5 |
| | Anadolu high school | 122 | 20.7 |
| Grade Level | 9 | 156 | 26.5 |
| | 10 | 148 | 25.1 |
| | 11 | 147 | 25.0 |

| | | | |
|---|---|---|---|
| | 12 | 138 | 23.4 |
| Mother's Education Status | Primary Education | 191 | 32.4 |
| | High School | 220 | 37.4 |
| | Undergraduate | 139 | 23.6 |
| | Postgraduate | 39 | 6.6 |
| Father's Education Status | Primary Education | 149 | 25.3 |
| | High School | 203 | 34.5 |
| | Undergraduate | 180 | 30.6 |
| | Postgraduate | 57 | 9.7 |
| Family Income Level | Low | 95 | 16.1 |
| | Medium | 320 | 54.3 |
| | High | 174 | 29.5 |

According to Table 1; of the 589 participants in the research group, 263 (44.7%) are male and 326 (55.3%) are female. 113 (19.2%) of the participants are studying in a science high school, 108 (18.3%) in a social sciences high school, 125 (21.2%) in a vocational high school, 121 (20.5%) in an imam-hatip high school, and 122 (20.7%) in an Anatolian high school. There are 156 (26.5%) students in the 9th grade, 148 (25.1%) in the 10th grade, 147 (25%) in the 11th grade, and 138 (23.4%) in the 12th grade. Of the participants, 220 (37.4%) had mothers who had a high school education, 191 (32.4%) had mothers who had a primary school education, 139 (23.6%) had mothers who had a bachelor's degree, and 39 (6.6%) had mothers who had a postgraduate degree. Of the participants, 203 (34.5%) had fathers who had a high school education, 180 (30.6%) had fathers who had a bachelor's degree, 149 (25.3) had fathers who had a primary school education, and 57 (9.7%) had fathers who had a postgraduate degree. Finally, 320 (54.3%) had families with middle income, 95 (16.1%) had families with low income, and 174 (29.5%) had families with high income.

## Measures

The tools used to collect data in the study are as follows;

Personal Information Form: The form prepared by the researcher includes the type of school the participants attend, their grade level, gender, their mothers' and fathers' education level, and their families' income level. Multidimensional 21st Century Skills Scale: The scale, developed by Çevik and Şentürk (2019) and consisting of 41 items, includes five sub-dimensions called “information and technology literacy, critical thinking and problem solving, entrepreneurship and innovation, social responsibility and leadership skills, career awareness”. The scale is in the form of a 5-point Likert and includes five options ranging from “I completely agree” to “I completely disagree”. For this study, the Cronbach’s Alpha internal consistency coefficient of the scale was obtained as .83. The Cronbach’s Alpha value being above 0.70 indicates that the reliability value of the scale is acceptable (Keskin and Pakdemirli, 2016; Coşkun and Bebiş, 2015; Büyüköztürk et al., 2004).

Future Visions Scale: The "Future Visions Scale" developed by Ginevra et al. (2017) was adapted to Turkish by Akça et al. (2018) after conducting a validity and reliability study. The scale, consisting of 18 items, reveals individuals' hope, optimism and pessimism levels for the future as a whole. For this study, the Cronbach's Alpha internal consistency coefficient of the scale was obtained as .80.

Career Anxiety Scale: The scale, developed by Çetin Gündüz and Nalbantoğlu Yılmaz (2016), consists of 2 sub-dimensions and 14 questions. The first five items in the scale measure career anxiety related to family influence, and the following nine items measure career anxiety related

to career choice. For this study, the Cronbach's Alpha internal consistency coefficient of the scale was obtained as .90..

## Data analysis

In the analysis of the research data, the normality of the distribution of the collected data was first tested. For this, the Kolmogorov-Smirnov and Shapiro-Wilk tests were performed, and the skewness and kurtosis values of the distribution shown in Table 2 were examined.

**Table 2** Skewness-kurtosis table for normality of distribution

| Scale | Skewness | Kurtosis |
|---|---|---|
| Future Orientation | .231 | .082 |
| Career Anxiety | -.038 | -.251 |
| Multidimensional 21st Century Skills | -.121 | .214 |

According to Tabachnick and Fidell (2013:3), the skewness and kurtosis values are between +1.5 and -1.5, and according to George and Mallery (2010:20), they are between -2 and +2, indicating that the distribution is normal and parametric tests can be used in the analysis of the data. Based on this, when the skewness and kurtosis values shown in Table 3.2 are examined, it can be said that the distribution is normal.

In the analysis and interpretation of the data, the five-point scale intervals were determined as equal intervals at a rate of 0.80 (5 - 1 = 4 ⇒ 4/5 = 0.80) as follows: 5.00 - 4.20 = Strongly agree; 4.20 - 3.40 = Agree; 3.40 - 2.60 = Undecided; 2.60 - 1.80 = Disagree; 1.80 - 1.00 = Strongly Disagree.

The relationship between correlations is shown by the correlation coefficient (r), which takes a value between +1 and -1. A correlation coefficient approaching ±1 indicates a perfect relationship, while approaching 0 means there is no relationship. If the correlation coefficient is less than 0.30, the relationship is weak, if it is between 0.30 and 0.70, the relationship is considered moderate, and if it is greater than 0.70, the relationship is considered high (Büyüköztürk et al., 2022: 192; Karasar, 2009: 220).

The relationship between future orientation and career anxiety was revealed by Pearson Product Moment Correlation. The mediating role of 21st century skills in the relationship between variables was analyzed using structural equation modeling. In this way, the relationship between variables was tried to be revealed. (Dursun & Kocagöz, 2010; Temurtaş, 2022). AMOS program was used in the analysis related to mediation. SPSS package program was also used for other descriptive statistics such as mean, standard deviation, correlation calculation. Goodness of fit indexes and normal values used in confirmatory factor analysis (DFA) for structural equation model, goodness of fit criteria related to index normal value acceptable fit values are given in Table 3.

**Table 3** Acceptable fit values for DFA

| No | Compliance Measures | Good Compliance | Acceptable Compliance |
|---|---|---|---|
| 1 | $x^2$ | - | - |
| 2 | $x^2$/ sd | $0 < x^2/ df < 2$ | $2 < x^2 / sd < 5$ |
| 3 | RMSEA | 0 < RMSEA < 0.05 | 0.05< RMSEA < 0.08 |
| 4 | GFI | 0.90 < GFI < 1.00 | 0.85 < GFI < 0.90 |
| 5 | CFI | 0.95 < CFI < 1.00 | 0.90 < CFI < 0.95 |
| 6 | SRMR | 0 < SRMR < 0.05 | 0.05 < SRMR < 0.10 |

Source: Yeşildal, Erişen ve Kıraç, 2020.

## Findings

### Findings regarding the variables of the study

Descriptive statistics results regarding the research variables of high school students' future orientation, career anxiety and 21st century skills scores are shown in Table 4.

**Table 4** Descriptive statistics table for scale scores

| Scale | Subfactor | Minimum | Maximum | $\bar{x}$ | ss |
|---|---|---|---|---|---|
| Future orientation | Optimistic | 1.00 | 5.00 | 2.90 | .91924 |
| | Pessimistic | 1.00 | 5.00 | 2.01 | .85079 |
| | Hope | 1.00 | 5.00 | 3.39 | .93782 |
| | Gytotal | 1.33 | 5.00 | 2.84 | .58120 |
| Career anxiety | Family | 1.00 | 5.00 | 2.15 | .92892 |
| | Occupational | 1.00 | 5.00 | 3.21 | .98916 |
| | Total | 1.00 | 5.00 | 2.83 | .82665 |
| 21st century skills | Information | 1.00 | 5.00 | 3.76 | .60536 |
| | Critical | 1.00 | 5.00 | 2.34 | .77912 |
| | Entrepreneurship | 1.00 | 5.00 | 3.23 | .71209 |
| | Social | 1.00 | 5.00 | 2.78 | .64526 |
| | Career | 1.50 | 4.83 | 3.76 | .49553 |
| | 21Yytotal | 1.49 | 4.59 | 3.33 | .37254 |

When looking at Table 4, it is seen that the participants' future orientations are at the level of "describes me sufficiently" with $\bar{x}$=2.84, their career concerns are at the level of "undecided" with $\bar{x}$=2.83, and their 21st century skills are at the level of "undecided" with $\bar{x}$=3.33.

When the sub-dimensions of the future orientation scale were examined; it was determined that the highest level was the "hope" ($\bar{x}$=3.39) dimension and it was at the level of describing me sufficiently, while the lowest level was the "pessimistic" ($\bar{x}$=2.01) dimension and it was at the level of describing me somewhat. In addition, the "optimistic" ($\bar{x}$=2.90) sub-dimension was at the level of describing me sufficiently.

When the sub-dimensions of the career anxiety scale are examined, the “professional (concern about career choice)” ($\bar{x}$=3.21) dimension is at the undecided level and the “family (concern about family influence)” ($\bar{x}$=2.15) dimension is at the disagreement level. When the “concern about career choice” and “concern about family influence” dimensions are examined together, it is seen that the “concern about career choice” dimension is higher.

When the sub-dimensions of the 21st century skills scale are examined; the sub-dimensions of “information (information and technology literacy)” ($\bar{x}$=3.76) and “career (career awareness)” ($\bar{x}$=3.76) are at the highest level and are at the level of “I agree”. Another sub-dimension, “critical (critical thinking and problem solving)” ($\bar{x}$=2.34), is the sub-dimension with the lowest level of “I disagree”. In addition, the dimensions of “entrepreneurship (entrepreneurship and innovation)” ($\bar{x}$=3.23) and “social (social responsibility and leadership skills)” ($\bar{x}$=2.78) are at the level of “I am undecided”.

### Findings by gender

The t-test analysis conducted to determine whether there is a significant difference in students' future orientation, career anxiety and 21st century skills levels in terms of gender variable is given in Table 5.

**Table 5** T-test table for gender

| | Dimensions | Gender | N | X Avg. | ss | sd | t | p |
|---|---|---|---|---|---|---|---|---|
| Future orientation | Optimistic | Male | 263 | 3.01 | .91538 | 587 | 2.779 | .006* |
| | | Female | 326 | 2.80 | .91295 | | | |
| | Pessimistic | Male | 263 | 2.11 | .92985 | 587 | 2.652 | .008* |
| | | Female | 326 | 1.92 | .77271 | | | |
| | Hopeful | Male | 263 | 3.45 | .98294 | 587 | 1.388 | .166 |
| | | Female | 326 | 3.35 | .89842 | | | |
| | Total | Male | 263 | 2.93 | .62435 | 587 | 3.432 | .001 |
| | | Female | 326 | 2.77 | .53375 | | | |
| Career anxiety | Family | Male | 263 | 2.15 | .95493 | 587 | .044 | .965 |
| | | Female | 326 | 2.14 | .90887 | | | |
| | Professional | Male | 263 | 3.05 | 1.00865 | 587 | -3.732 | .000* |
| | | Female | 326 | 3.34 | .95343 | | | |
| | Total | Male | 263 | 2.72 | .83555 | 587 | -2.835 | .005 |
| | | Female | 326 | 2.91 | .81045 | | | |
| 21st century skills | Knowledge | Male | 263 | 3.74 | .68083 | 587 | -.868 | .386 |
| | | Female | 326 | 3.78 | .53711 | | | |
| | Critical | Male | 263 | 2.42 | .87480 | 587 | 2.236 | .026* |
| | | Female | 326 | 2.28 | .68707 | | | |
| | Entrepreneurship | Male | 263 | 3.25 | .79102 | 587 | .449 | .654 |
| | | Female | 326 | 3.22 | .64239 | | | |
| | Social | Male | 263 | 2.72 | .70881 | 587 | -2.182 | .030* |
| | | Female | 326 | 2.84 | .58499 | | | |
| | Career | Male | 263 | 3.70 | .54796 | 587 | -2.825 | .005* |
| | | Female | 326 | 3.81 | .44299 | | | |
| | Total | Male | 263 | 3.32 | .42560 | 587 | -.527 | .598 |
| | | Female | 326 | 3.34 | .32397 | | | |

*p< .05 Significance level

In light of the data in Table 5, significant differences were found as a result of the t-test conducted on the total score regarding whether there were significant differences in terms of students' future orientation, career anxiety and 21st century skill levels in terms of gender variable. According to the sub-factors of the scales:

In terms of “future orientation”, a significant difference was found in the optimistic (t=2.779; p<.05) and pessimistic (t=2.652; p<.05) sub-factors. The significant difference was in favor of male students in both sub-dimensions (optimistic $\bar{x}$=3.01 and pessimistic $\bar{x}$=2.11). In other words, male students have more positive future orientations than females.

In terms of “career anxiety”, a significant difference was found in the profession (anxiety about career choice) sub-dimension (t=-3.732; p<.05). The significant difference was in favor of female students ($\bar{x}$=3.34). In other words, females' anxiety about career choice was higher than males.

In terms of “21st century skills”; a significant difference was found in favor of male students ($\bar{x}$=2.42) in the critical (critical thinking and problem solving) sub-factor (t=2.236; p<.05), in favor of female students ($\bar{x}$ =2.84) in the social (social responsibility and leadership skills) sub-factor (t=2.182; p<.05) and in favor of female students ($\bar{x}$=3.81) in the career (career awareness) sub-factor (t=2.825; p<.05). While male students have higher means in critical thinking and problem solving sub-dimensions, female students have higher means than males in terms of social responsibility and leadership skills and career awareness.

## Findings by school type

The variance analysis conducted to determine whether there is a significant difference in students' future orientation, career anxiety and 21st century skills levels in terms of school type

variable is given in Table 6.

**Table 6** Variance analysis table by school type

| | Dimensions | Source | Sum of Squares | sd | Mean Squares | f | p | Significant Difference |
|---|---|---|---|---|---|---|---|---|
| Future Orientation | Optimistic | Intergroup | 2.512 | 4 | .628 | .742 | .564 | |
| | | Within group | 494.354 | 584 | .846 | | | |
| | | Total | 496.865 | 588 | | | | |
| | Pessimistic | Intergroup | 2.224 | 4 | .556 | .767 | .547 | |
| | | Within group | 423.397 | 584 | .725 | | | |
| | | Total | 425.620 | 588 | | | | |
| | Hope | Intergroup | 9.039 | 4 | 2.260 | 2.597 | .035* | Between science and profession and Ihla, in favor of science; between social and profession, in favor of profession |
| | | Within group | 508.115 | 584 | .870 | | | |
| | | Total | 517.154 | 588 | | | | |
| | Total | Intergroup | 2.212 | 4 | .553 | 1.645 | .162 | |
| | | Within group | 196.413 | 584 | .336 | | | |
| | | Total | 198.625 | 588 | | | | |
| Career anxiety | Family | Intergroup | 12.355 | 4 | 3.089 | 3.644 | .006* | Between Ihl and Science and Social in favor of Ihl |
| | | Within group | 495.026 | 584 | .848 | | | |
| | | Total | 507.381 | 588 | | | | |
| | Vocational | Intergroup | 19.855 | 4 | 4.964 | 5.219 | .000* | Science, Profession, Ihl, Anatolia in favor of Science |
| | | Within group | 555.471 | 584 | .951 | | | |
| | | Total | 575.326 | 588 | | | | |
| | Total | Intergroup | 15.498 | 4 | 3.875 | 5.857 | .000* | Between science and Ihl, profession and Anatolia in favor of others<br>Between Ihl and social in favor of Ihl |
| | | Within group | 386.314 | 584 | .661 | | | |
| | | Total | 401.813 | 588 | | | | |
| 21st century skills | Information | Intergroup | 3.845 | 4 | .961 | 2.652 | .032* | Between Ihl and Social in favor of Social |
| | | Within group | 211.634 | 584 | .362 | | | |
| | | Total | 215.479 | 588 | | | | |
| | Critical | Intergroup | 6.673 | 4 | 1.668 | 2.781 | .026* | Between Ihl and Fen and Anatolia in favor of Ihl |
| | | Within group | 350.264 | 584 | .600 | | | |
| | | Total | 356.937 | 588 | | | | |
| | Enterprise | Intergroup | 3.366 | 4 | .841 | 1.667 | .156 | |
| | | Within group | 294.789 | 584 | .505 | | | |
| | | Total | 298.154 | 588 | | | | |
| | Social | Intergroup | 4.691 | 4 | 1.173 | 2.852 | .023* | Between profession and social in favor of profession |
| | | Intragroup | 240.130 | 584 | .411 | | | |
| | | Total | 244.821 | 588 | | | | |
| | Career | Intergroup | 1.985 | 4 | .496 | 2.035 | .088 | |
| | | Intragroup | 142.398 | 584 | .244 | | | |
| | | Total | 144.383 | 588 | | | | |
| | Total | Intergroup | .933 | 4 | .233 | 1.688 | .151 | |
| | | Intragroup | 80.675 | 584 | .138 | | | |
| | | Total | 81.607 | 588 | | | | |

*p< .05 level of significance

According to Table 6, as a result of the variance analysis conducted to determine whether there is a significant difference in the students' future orientation, career anxiety and 21st century skills levels in terms of the school type variable:

In terms of “future orientation”; a significant difference was found in the hope sub-factor (f=2.597<.05). No significant difference was found in the analysis of the other sub-dimensions of the scale, and Tukey HSD test was applied for the significance in the hope factor. As a result of

the PostHoc Analysis, a significant difference was found between science high schools and vocational high schools and IHL (Imam-Hatip high schools) in favor of science high schools; and between social sciences high schools and vocational high schools in favor of vocational high schools.

In terms of "career anxiety"; a significant difference was found in the family (anxiety about family influence) (f=3.644<.05) and occupational (anxiety about career choice) (f=5.219<.05) sub-factors and in total (f=5.857<.05). Tukey HSD test was applied for significant difference. As a result of PostHoc Analysis, when we look at the total, a significant difference is found between science high school ($\bar{x}$=2.57) and imam-hatip high school ($\bar{x}$=2.98), vocational high school ($\bar{x}$=2.97) and Anatolian high school ($\bar{x}$=2.87) in favor of imam-hatip high school, vocational high school and Anatolian high school; a significant difference is found between imam-hatip high school ($\bar{x}$=2.98) and social sciences high school ($\bar{x}$=2.68) in favor of imam-hatip high school. When the sub-dimensions are examined, a significant difference was found in the family (anxiety about family influence) dimension between imam-hatip high school ($\bar{x}$=2.38) and science high school ($\bar{x}$=1.96) and social sciences high school ($\bar{x}$=2.01) in favor of imam-hatip high school; in the vocational (anxiety about career choice) dimension between science high school ($\bar{x}$=2.91) and vocational high school ($\bar{x}$=3.40), imam-hatip high school ($\bar{x}$=3.32), Anatolian high school ($\bar{x}$= 3.29) in favor of science high school.

In terms of "21st century skills"; significant differences were found in the sub-factors of information (information and technology literacy) (f=2.652<.05), criticism (critical thinking and problem solving) (f=2.781<.05) and social (social responsibility and leadership skills) (f=2.852<.05). No significant difference was found in the analysis related to other sub-dimensions of the scale. Tukey HSD test was applied for significant difference and as a result of the PostHoc Analysis, in the sub-dimension of information (information and technology literacy) there was a difference in favor of social sciences high school between imam-hatip high school ($\bar{x}$=3.65) and social sciences high school ($\bar{x}$=3.91); in the dimension of critical thinking and problem solving between imam-hatip high school ($\bar{x}$=2.52) and science high school ($\bar{x}$=2.22) and Anatolian high school ($\bar{x}$=2.24); In terms of social responsibility and leadership skills, a significant difference was found between social sciences high school ($\bar{x}$=2.68) and vocational high school ($\bar{x}$=2.93) in favor of vocational high school.

## Findings by grade level

The variance analysis conducted to determine whether there is a significant difference in students' future orientation, career anxiety and 21st century skills levels in terms of the grade level variable is given in Table 7.

**Table 7** Variance analysis table by grade level

| | Dimensions | Source | Sum of Squares | sd | Mean of Squares | f | p | Significant difference |
|---|---|---|---|---|---|---|---|---|
| Future orientation | Optimistic | Intergroup | 2.336 | 3 | .779 | .921 | .430 | |
| | | Within group | 494.529 | 585 | .845 | | | |
| | | Total | 496.865 | 588 | | | | |
| | Pessimistic | Intergroup | 3.981 | 3 | 1.327 | 1.841 | .138 | |
| | | Within group | 421.639 | 585 | .721 | | | |
| | | Total | 425.620 | 588 | | | | |
| | Hope | Intergroup | 2.354 | 3 | .785 | .892 | .445 | |
| | | Within group | 514.800 | 585 | .880 | | | |
| | | Toplam | 517.154 | 588 | | | | |
| | Total | Intergroup | 2.527 | 3 | .842 | 2.513 | .058 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Within group | 196.098 | 585 | .335 | | | |
| | | Total | 198.625 | 588 | | | | |
| Career anxiety | Family | Intergroup | 7.128 | 3 | 2.376 | 2.779 | .040* | Between 10-11, 10 is in favor |
| | | Within group | 500.253 | 585 | .855 | | | |
| | | Total | 507.381 | 588 | | | | |
| | Vocational | Intergroup | 3.640 | 3 | 1.213 | 1.242 | .294 | |
| | | Within group | 571.686 | 585 | .977 | | | |
| | | Toplam | 575.326 | 588 | | | | |
| | Total | Intergroup | 4.193 | 3 | 1.398 | 2.056 | .105 | |
| | | Within group | 397.620 | 585 | .680 | | | |
| | | Total | 401.813 | 588 | | | | |
| 21st century skills | Information | Intergroup | .402 | 3 | .134 | .364 | .779 | |
| | | Within group | 215.077 | 585 | .368 | | | |
| | | Total | 215.479 | 588 | | | | |
| | Critical | Intergroup | 2.248 | 3 | .749 | 1.236 | .296 | |
| | | Within group | 354.689 | 585 | .606 | | | |
| | | Total | 356.937 | 588 | | | | |
| | Entrepreneurship | Intergroup | 1.204 | 3 | .401 | .791 | .499 | |
| | | Within group | 296.950 | 585 | .508 | | | |
| | | Total | 298.154 | 588 | | | | |
| | Social | Intergroup | .413 | 3 | .138 | .330 | .804 | |
| | | Within group | 244.408 | 585 | .418 | | | |
| | | Total | 244.821 | 588 | | | | |
| | Career | Intergroup | .672 | 3 | .224 | .911 | .435 | |
| | | Within group | 143.711 | 585 | .246 | | | |
| | | Total | 144.383 | 588 | | | | |
| | Total | Intergroup | .214 | 3 | .071 | .513 | .674 | |
| | | Within group | 81.393 | 585 | .139 | | | |
| | | Total | 81.607 | 588 | | | | |

According to Table 7, as a result of the variance analysis conducted to determine whether there is a significant difference in the students' future orientation, career anxiety and 21st century skills levels in terms of the grade level variable:

In terms of “Career anxiety”; a significant difference was found in the family (anxiety towards family influence) sub-factor (f=2.779<.05). No significant difference was found in the analysis of other sub-dimensions of the scale, and Tukey HSD test was applied for the significance found in the anxiety towards family influence factor. As a result of PostHoc Analysis, a significant difference was found between 10th grade students and 11th grade students in favor of 10th grade students.

No significant difference was found at the grade level in terms of “future orientation” and “21st century skills”.

## Findings regarding the relationship between variable

The relationships between the future orientation, career anxiety and 21st century skills and the sub-dimensions included in the study were examined with Pearson correlation analysis and are presented in Table 8 below.

**Table 8** Table of correlation values between variables

| Pearson Correlation | Family | Job | KK total | Optimistic | Pessimistic | Hope | GY total | Information | Criticism | Attempt | Social | Career |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Job | ,401** | | | | | | | | | | | |
| KK total | ,710** | ,930** | | | | | | | | | | |
| Optimistic | -,255** | -,371** | -,387** | | | | | | | | | |
| Pessimistic | ,278** | ,339** | ,372** | -,203** | | | | | | | | |
| Hope | -,249** | -,375** | -,388** | ,586** | -,270** | | | | | | | |
| GY total | -,178** | -,293** | -,296** | ,812** | ,130** | ,827** | | | | | | |
| Information | -,151** | -,172** | -,193** | ,188** | -,163** | ,361** | ,259** | | | | | |
| Criticism | ,067 | ,114** | ,114** | -,033 | ,398** | -,118** | ,070 | -,153** | | | | |
| Attempt | -,159** | -,339** | -,324** | ,344** | -,164** | ,424** | ,380** | ,645** | -,051 | | | |
| Social | ,020 | ,155** | ,127** | -,123** | ,015 | -,292** | -,242** | -,454** | -,104* | -,486** | | |
| Career | -,135** | -,032 | -,079 | ,111** | -,224** | ,300** | ,156** | ,557** | -,232** | ,430** | -,310** | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21st century total | -,166** | -,205** | -,225** | ,263** | -,092* | ,385** | ,343** | ,880** | ,129** | ,836** | -,419** | ,603** |

When the data in Table 8 is examined, it is seen that there is a low level negative significant relationship between career anxiety (kktotal) and future orientation (gytotal) (r=-.29); a low level negative significant relationship between career anxiety (kktotal) and 21st century skills (21st century general) (r=-.22); and a low level positive significant relationship between future orientation (gytotal) and 21st century skills (21st century general) (r=.34). It was determined that there were low level positive or negative relationships between the sub-dimensions in the entire scale.

## Findings on the mediating role of 21st century skills

The mediating role of 21st century skills in the relationship between future orientation and career anxiety scores was tested with structural equation modeling and model 1 was created. The findings obtained as a result of the analysis are shown in Figure 2.

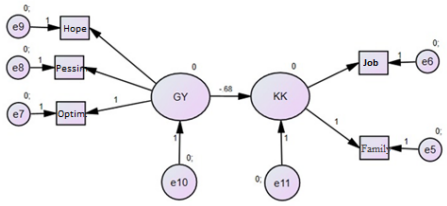


**Figure 2** Mediator Role-Model 1

GY: Future Orientation, KK: Career Anxiety

In the study, the measurement models related to the scale sub-dimensions were first evaluated in the analysis of the data obtained from the scales. In this direction, the method suggested by Baron and Kenny (1986) was used for the mediating role of 21st century skills in the relationship between students' future orientation and career concerns. According to this method, there should be a significant relationship between the mediating variable (21st century skills) and the predictor variable (future orientation). In addition, when the effect of the predictor variable (future orientation) is examined, the mediating variable (21st century skills) should significantly predict the predicted variable (career anxiety). When the effect of the mediating variable is taken into account, the relationship between the predictor variable (future orientation) and the predicted variable (career anxiety) should decrease or become insignificant. Model 2 was created to investigate this hypothesis and tested using structural equation modeling. The findings obtained as a result of the analysis are shown in Figure 3.

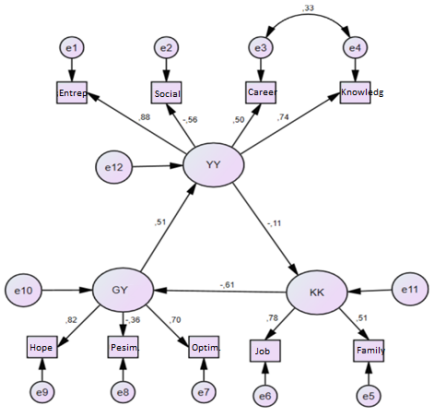


**Figure 3** Mediator Role-Model 2

GY: Future Orientation, KK: Career Anxiety, Family: Anxiety About Family Influence, Profession: Anxiety About Career Choice, YY: 21st Century Skills, Knowledge: Information and Technology Literacy, Entrepreneurship: Entrepreneurship and Innovation, Social: Social Responsibility and Leadership, Career: Career Consciousness.

When the fit indices of the created model are examined, it is seen that the model is confirmed by showing fit ($x^2$=156.672, sd=23, $x^2$/sd = 6.812, RMSEA= .099, NFI= .89, CFI= .91). According to the test results in Model 1 and Model 2, the existence of the mediation effect was examined with the method suggested by Baron and Kenny (1986). When Model 2 in Figure 3 is examined, it is seen that the path coefficient between career anxiety and future orientation is -.61 when 21st century skills are included as a mediator variable. The decrease in the direct effect from -.68 in Model 1 in Figure 2 to -.61 in Model 2 in Figure 3 indicates that the mediator variable (21st century skills) partially mediates. Since a decrease in the effect is observed, it can be said that 21st century skills partially mediate this relationship.

## 4 Discussion and conclusion

As a result of the research; it is seen that each of the general score averages collected from the scales is at a moderate level. Since high school students in adolescence begin to see themselves as autonomous beings, they are expected to be able to define their thoughts about their future (Özdemir & Çok, 2011). Konidari and Benetton (2019) state that especially after the 1950s, young people in many countries have engaged in deliberate procrastination behavior, extended the time required for preparation for professional life, postponed starting work, and therefore preferred to live with uncertainties about the future. Trommsdorf (1986) states that they may avoid determining and making choices about which lifestyle is best for them. As technological developments around the world change the business world and employment policies (Di Maggio et al., 2016; Ginevra et al., 2017; Ginevra et al., 2018; Guichard et al., 2015; Hirschi and Dauwalder, 2015; Savickas et al., 2009), high school students can be expected to be undecided and uncertain about their future orientations..

During their adolescence, high school students experience intense and unstable emotions such as outbursts of anger, crying spells, excessive enthusiasm, excitement or anxiety (Topçuoğlu, 2023). In addition, this period is a period when the risk of hopelessness and depression increases due to many conflicts that occur in the inner world of adolescents (Tamar & Özbaran, 2004). In this study, the hope sub-dimension scores of high school students were higher compared to other dimensions and the pessimistic sub-dimension scores were at the lowest level. Studies have shown that individuals with a high level of hope throughout their lives; They are more successful in aspects such as coping with difficulties, making decisions, managing stressful situations, being flexible and adaptable, and exhibiting resilience skills (Zeng et al., 2022; Ginevra et al., 2018; Ginevra et al., 2017; Savickas et al., 2009; Altınay, 2018; Hagen et al., 2005; Boo et al., 2021).

The adolescence period that high school students are in is a period in which they realize their interests and abilities more, the importance they give to social acceptance increases, they spend more time on friendships, they experience conflicts in terms of self-awareness and personality development, they try to gain their autonomy, and while doing all these, they make a career choice, make a career decision and strive for the most accurate career planning for themselves (Akbaş & Okutan, 2020; Beyers et al., 2024; Dönmezer, 2003; Işık, 2014; Korkmaz & Kırdök, 2022). Therefore, the fact that the anxiety level of high school students regarding the choice of profession is higher than the anxiety regarding the family influence within the scope of this research can be

considered as a result parallel to the developmental period tasks of individuals.

According to the data obtained in the study, the 21st century skill score average of high school students is higher in the information and technology literacy sub-dimension and lower in the critical thinking and problem solving sub-dimension. In the study conducted by Engin and Korucuk (2021) on the subject, it is seen that the information and technology literacy average is high. The results of the study conducted by Valtonen and his colleagues (2021) show that information and technology use skills change more and more every year. In addition, children and young people growing up in the 21st century world, where technology continues to develop rapidly, are surrounded by these devices and the duration of their use of these tools increases day by day (Zeybekoğlu Akbaş & Dursun, 2020). This situation can be considered as the reason why the information and technology literacy sub-dimension average is higher than the other sub-dimensions. When the fact that the score average for the critical thinking and problem solving sub-dimension is lower compared to the other dimensions is evaluated; It can be said that the results of the study conducted by Çelik (2021) and this study have similar results. Aktaş et al. (2023) stated in their study that participants who spent more than four hours without internet and phone received higher scores on the problem-solving skills scale than participants who spent less than four hours. Based on this, it can be thought that there is a negative relationship between the duration of use of technology and digital systems and the critical thinking and problem-solving skills of individuals.

When the future orientation is evaluated in terms of gender in the study; it is seen that the future orientation of male students is more positive than that of female students. In many studies conducted on the future orientation of students (Altınay, 2018; İmamoğlu & Güler-Edwards, 2007; Jia et al., 2022; Mello et al., 2013), no significant difference has been found in terms of gender. However, Shoshana (2020) states in her study that Muslim male students studying in Israel are hopeless because they do not believe that the future will be better and therefore drop out of high school education. Şimşek et al. (2022), on the other hand, state in their study - similar to this study - that the future expectations of female students are lower than male students. Based on this information, the fact that male students have a more positive future orientation compared to female students can be evaluated in the context of the gender roles of the society in which they live.

When the future orientation findings are examined in terms of school type, it can be said that science high school students are more hopeful than other high school students. Contrary to this study; In the study conducted by Şimşek et al. (2022), the future expectation levels of science high school students were found to be the lowest among other school types. There is no other study confirming this research result. In addition; science high school students are placed in these schools with the high-level scores they receive after a serious exam preparation in order to be able to enroll in the schools they study. Science high school students, who experience reaching their goals after the difficulties they experienced in the exam preparation process; have self-confidence, and both they and the people around them are hopeful that they will have good jobs. Many studies have shown that individuals with a high level of hope and a positive outlook on the future have higher skills in coping with difficulties and managing stressful situations (Altınay, 2018; Boo et al., 2021; Ginevra et al., 2017; Ginevra et al., 2018; Hagen et al., 2005; Savickas et al., 2009; Zeng et al., 2022). This can be considered as the reason why science high school students have a more hopeful future orientation compared to other school students.

Trommsdorff et al. (1979) mentioned in their research conducted two years apart that there are differences in individuals' future orientations over time. Altınay (2018) stated in his study that there are differences between adolescents' positive future orientations and age level, and that a 15-year-old adolescent's positive future orientation is lower than a 12-13-year-old adolescent. However, as a result of the research, no significant difference was found in future orientation in terms of grade level. The perspective and individual differences of the students who made up the sample can be considered as the reason for this situation.

Findings regarding career anxiety in terms of gender show that female students have higher anxiety regarding career choice than male students. The fact that male students have a more positive perspective in terms of future orientation compared to female students, which is stated in other results of the study, also supports this result. It is seen that similar results were reached in the study conducted by Göncü Akbaş and Okutan (2020); while there is no significant difference regarding family influence regarding gender factor, female students have higher anxiety level regarding career choice. This situation of female students with higher anxiety score average regarding career choice suggests career structuring depending on social norms and expectations (Hartung et al., 2005; Makarova et al., 2019; Şeker, 2020).

When evaluated in terms of school type, it is seen that science high school students' career anxiety is lower than other high school students. It is thought that this result matches the findings regarding the hope factor, which is the sub-dimension of future orientation. Science high school students with a hopeful future orientation are likely to have a low career anxiety average (Çalışkan and Dilmaç, 2021; Ginevra et al., 2017; Hagen et al., 2005; Savickas et al., 2009). In addition, considering that their past successes will increase their self-confidence, students who get into science high school through the high school entrance exam are likely to feel less anxious than students from other schools during the university exam and the subsequent career construction process. Zeng et al. (2022) state in their study that academic self-confidence has an effect on hope and life satisfaction. Cırcır et al. (2024) stated in their study that low academic success level causes young people to approach their careers with anxiety. When career anxiety sub-dimensions are examined; The anxiety of imam-hatip high school students regarding family influence was higher than the anxiety of science high school students regarding career choice. In their research, Nalbantoğlu Yılmaz and Çetin Gündüz (2018) concluded that students with low and medium academic success had high anxiety regarding family influence, while students with high academic success had high anxiety regarding career choice. The researchers explained this as the anxiety of students with low academic success thinking that they will fail in the exams they will take and not being able to meet their families' expectations. In this study, the students who experienced the most anxiety regarding family influence were imam-hatip high school students, but since there was no data regarding school success, a comparison could not be made. Yavrutürk (2023) explained career anxiety as not being able to reach goals, not being able to focus, loss of performance or sleep problems; Nalbantoğlu Yılmaz and Çetin Gündüz (2018) explained it as not being able to make a career decision. Therefore, it is thought that the anxiety of science high school students regarding career choice can be explained in light of these definitions.

When career anxiety is examined in terms of grade level variable, 10th grade students' anxiety about family influence is determined to be higher than 11th grade students. Young people in adolescence want to create their own personal spaces and preferences and be autonomous day by day (Özdemir & Çok, 2011). Therefore, it can be expected that anxiety about family influence

decreases with age. However, although the opinions of their friends start to be important for adolescents, they may want to get their families' opinions on decisions that will affect their lives (Wilks, 1986; Nurmi, 1991). At this point; it comes to mind that students studying in high schools make their course selections for the field they plan to study at university and answer questions about in the university exam at the end of the 10th grade. Since students also get their families' opinions during this process, it can be said that 10th grade students' anxiety about family influence is higher than 11th grade students.

When 21st century skills are examined in terms of gender; in terms of 21st century skills, male students have higher critical thinking and problem solving skill score averages than female students, and female students have higher averages than male students in social responsibility and leadership skills and career awareness sub-factors. According to the results of the research conducted by Can Göl (2023), Kanwal and Choudhary (2023) and Konate (2022); contrary to the current research, there is a significant difference in favor of female students in critical thinking and problem solving skills. A similar result is also seen in the study conducted by Ay and Akgöl (2008) on the critical thinking power of students; the critical thinking power of female students is higher than male students. Regarding the social responsibility and leadership sub-dimension; Engin and Korucuk (2021) - unlike this study - concluded that male students have higher social responsibility and leadership skills than female students. When the career sub-dimension is evaluated, according to the findings obtained from the study of Engin and Korucuk (2021), female students have higher career awareness than male students, and this is a similar result to the current research. When the results of Can Göl (2023)'s study on career awareness skills are examined, it is seen that the results are parallel to this research and there is a significant difference in favor of female students. In addition, some of the studies conducted have concluded that there is no significant difference between 21st century skills and gender (Soruklu & Şentürk, 2023; Öztürk, 2023; Varki, 2020). It is natural for individual differences to occur depending on factors such as different parents, different socio-economic opportunities, and different upbringing styles. The fact that the results obtained within the scope of this research are similar and different to other studies can also be evaluated in the context of individual differences.

When 21st century skills are evaluated in terms of school type; Imam-Hatip high school students have higher average scores in terms of critical thinking and problem solving than science and Anatolian high school students. Based on Çelik (2021)'s study, it is thought that there is a significant relationship between the field in which students study and the skills they have. Accordingly; The inclusion of skills such as explaining the principles and fundamentals of faith in a rational way and responding to opposing ideas (Algül & Meydan, 2022) in the Imam-Hatip high school curriculum may contribute to the development of students in terms of critical thinking and problem solving. According to another finding of the research, social sciences high school students have higher average scores than Imam-Hatip high school students in the information and technology literacy sub-dimension. Social science high schools, which first became operational in the 2003-2004 academic year, were opened as schools with a science advisory board consisting of academics, aiming to train highly qualified scientists needed in the fields of literature and social sciences and to direct students to conduct research in these fields (Boybeyi & Boybeyi, 2007). Since their establishment, social science high school students may be using information access resources more due to their collaboration with universities and their

emphasis on scientific studies. In addition; the fact that imam hatip high school students have lower averages in terms of information and technology literacy may also be related to whether or not students prefer to use technological devices or whether or not they have technological devices. When the 21st century skills possessed by high school students are approached in terms of school type, the final finding obtained is that vocational high school students have higher averages in terms of social responsibility and leadership skills than social science high school students. The purpose of establishing vocational high schools is to provide their students with a profession. In this process, students work as interns in various institutions and organizations in order to gain the skills of the profession they have chosen by applying the knowledge they have acquired in formal education in the field (Kablay, 2021). Although this internship is not a full-time job, it is a process in which the student takes on responsibility and takes initiative by taking on a task. Having such experience can be considered as the reason why vocational high school students have a higher average in terms of social responsibility and leadership skills compared to social sciences high school students who have not yet experienced working life.

When the research data were examined, no significant difference was found in terms of grade level in 21st century skills. In this respect, it can be said that it is similar to the results of the study conducted by Çelik (2021). When the findings of the study conducted by Zeybek (2019) were examined, the 21st century skill level of 11th and 12th grade students was determined to be higher than 9th and 10th grade students. According to the results of the study conducted by Önür and Kozikoğlu (2018) on middle school students, it was seen that 21st century skills decreased as the grade level increased. It is thought that these differences emerged due to the place and time in which the studies were conducted, socio-economic variables and individual characteristics.

It was examined whether there was a significant relationship between high school students' future orientation scores, career anxiety scores and 21st century skills scores. As a result of the correlation analysis, it can be said that the career anxiety of students whose future orientation increased decreased, the career anxiety of students whose 21st century skills increased decreased and the future orientation of students whose 21st century skills increased also increased. When the research results on the subject (Akıncı, 2022; Aydoğan et al., 2022; Boo et al., 2021; Can Göl, 2023; Demir & Çolakkadıoğlu, 2023; Fusco et al., 2019; Konate, 2022; Korkmaz, 2023; Samancı, 2023; Taş & Özmen, 2019; Temurtaş, 2022; Yıldırım Kurtuluş et al., 2022; Zeng et al., 2022) were examined, it was seen that the studies supported the results of this research. Based on all these results; It can be said that when 21st century skills increase, future orientation will increase, and when 21st century skills and future orientation increase, career anxiety will decrease.

This study examined whether 21st century skills have a mediating role in the relationship between future orientation and career anxiety of high school students. In light of the findings, it can be said that 21st century skills partially mediate this relationship. When the literature was reviewed in the context of the variables included in the study ( Boo et al., 2021; Bölükbaşı & Kırdök, 2019; Doğanülkü & Güneşlice, 2022; Taş & Özmen, 2019; Yıldırım Kurtuluş et al., 2022) no study similar to this research in all aspects was found. However, it was observed that the research variables future orientation, career anxiety and 21st century skills are related to each other. It is thought that hope and optimism, which are the sub-dimensions of future orientation, reduce career anxiety by contributing to the individual's career process, and 21st century skills strengthen the

individual and support a positive perspective, thus showing a mediating effect.

## Limitations

The research is limited to high school students studying in the city of Samsun in Turkey and the data obtained from the application of the scales used.

## Statement of Researchers

In this section, you are expected to declare the information regarding the titles given below.

### Declaration of contribution rate of researchers

Researchers contributed equally to this study.

### Conflict statement

There was no conflict of interest among the authors.

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## References

Abdullah, M. Q. (2018). Optimism/pessimism and ıts relationship with locus of control among children and adolescents. *Mathews Journal of Psychiatry & Mental Health*, 3(1), 017. Retrieved April 5, 2024 from https://www.mathewsopenaccess.com/full-text/optimism-pessimism-and-its-relationship-with-locus-of-control-among-children-and-adolescents

Akbaş, M. G., & Okutan, E. (2020). Lise öğrencilerinin kariyer kaygısına yönelik alan araştırması: Antalya ili örneği. [A research on the career anxieties of high school student: Sample of Antalya province]. *Gençlik Araştırmaları Dergisi*, 8(20), 158-187. https://dergipark.org.tr/en/download/article-file/1164722

Akça, M. Ş., Korkmaz, O., & Alkal, A. (2018). Gelecek vizyonları ölçeği Türkçe formu geçerlik ve güvenirlik çalışması. [Turkish form of the visions about future scale: validity and reliability studies]. *Kariyer Psikolojik Danışmanlığı Dergisi*, 1(1), 1-21. https://dergipark.org.tr/en/download/article-file/610903

Akıncı, A. Y. (2022). Anadolu Lisesi öğrencilerinin yirmi birinci yüzyıl becerileri ve kariyer kaygısı. [Twenty-first century skills and career anxiety of Anatolian high school students]. *Journal of Social, Humanities and Administrative Sciences*, 8(57):1338-1345. http://dx.doi.org/10.29228/JO

Aktaş, E., Donmez, E., Canıbeyaz, R., & Gedik, M. (2023). Üniversite öğrencilerinde mobil bağımlılık düzeyi ve problem çözme becerisinin incelenmesi. [Investigation of mobile addiction level and problem solving skills of university students]. *Fenerbahçe Üniversitesi Sağlık Bilimleri Dergisi,* 3(2), 188-204. https://doi.org/10.56061/fbujohs.1183929

Algül, Ö., & Meydan, H. (2022). Aihl Kelam ders kitabında "Dinin Anlaşılmasında Farklı Yorumlar" ünitesinin eleştirel düşünme açısından incelenmesi. [Analyzing the unit of "Different interpretations in the understanding of religion" in the Anatolian imam hatip high school Kalam textbook in terms of critical thinking]. *Türkiye Din Eğitimi Araştırmaları Dergisi* (13), 95-120. https://doi.org/10.53112/tudear.1100038

Altınay, B. (2018). *12-15 Yaş grubu ergenlerin gelecek yönelimlerinin pozitif psikolojinin bazı değişkenleri açısından incelenmesi. [12-15 age group of adolescents future orientations investigation of some variables expansion of positive psychology].* Unpublished doctoral dissertation. Ankara Üniversitesi, Ankara.

Arslan, A. (2020). Öğretmen adayları perspektifinden pandemi öncesi ve sonrası öğrencilere kazandırılması gereken 21. yüzyıl becerilerinin belirlenmesi. [Determining the 21st century skills that should be instilled to students from the perspective of preservice teachers before and after the pandemic]. *Milli Eğitim Dergisi,* 49(1), 553-571. https://doi.org/10.37669/milliegitim.779446

Ay, Ş., & Akgöl, H. (2008). Eleştirel düşünme gücü ile cinsiyet, yaş ve sınıf düzeyi. [Critical thinking, gender, age and grade level]. *Journal of Theoretical Educational Science,* 1(2), 65-75. https://dergipark.org.tr/en/download/article-file/304497

Aydoğan M., Karatepe R., & Yelken, Y. T. (2022). Üniversite öğrencilerinin kariyer farkındalıklarıyla 21. yüzyıl becerileri arasındaki ilişkinin incelenmesi. [Examining the relationship between university students' career awareness and skills in the 21st century]. *İnönü Üniversitesi Eğitim Fakültesi Dergisi,* 23(3), 1578-1597. https://doi.org/10.17679/inuefd.1132893

Bayhan, Ö. (2024). Lise öğrencilerinin gelecek yönelimi ve kariyer kaygısı ilişkisinde 21. yüzyıl becerilerinin aracı rolü. *[The mediating role of 21st century skills in the relationship between high school students' future orientation and career anxiety]*. Unpublished master's thesis. Ondokuzmayıs Üniversitesi, Samsun.

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*(6), 1173–1182. https://doi.org/10.1037/0022-3514.51.6.1173

Bayley, S. H. (2022). Learning for adaptation and 21st-century skills: Evidence of pupils' flexibility in Rwandan primary schools. *International Journal of Educational Development*, 93, 102642. https://doi.org/10.1016/j.ijedudev.2022.102642

Beyers, W., Soenens, B., & Vansteenkiste, M. (2024). Autonomy in adolescence: a conceptual, developmental and cross-cultural perspective. *European Journal of Developmental Psychology*, 1-21. https://doi.org/10.1080/17405629.2024.2330734

Binkley, M., Erstad, O., Herman, J., Raizen, S., Martin, R., & Rumble, M. (2010). *Defining 21st century skills*. Assessment & teaching of 21st century skills, The University of Melbourne. Retrieved March 31, 2024 from https://www.intel.com.tr/content/dam/www/public/emea/tr/tr/pdf/education/tools-and-resources/century21-skills-report.pdf

Boo, S., Wang, C., & Kim, M. (2021). Career adaptability, future time perspective, and career anxiety among undergraduate students: A cross-national comparison. *Journal of Hospitality, Leisure, Sport & Tourism Education*, 29, 100328. https://doi.org/10.1016/j.jhlste.2021.100328

Boybeyi, S., & Boybeyi, M. (2007). Sosyal bilimler lisesi örneğinde ortaöğretim: eğitim programlarında farklılaşmanın sonuçları. [Secondary education in the case of social sciences high school: the consequences of differentiation in education programs]. *Sosyal Politika Çalışmaları Dergisi*, 11(11), 51-55. https://dergipark.org.tr/en/download/article-file/198245

Bölükbaşı, A., & Kırdök, O. (2019). Lise öğrencilerinin kariyer uyumu ve yaşam doyumu ilişkisinde gelecek yöneliminin aracı rolü. [Mediating role of future orientation in the relationship between career adaptability and life satisfaction in high school students]. *Eğitim ve Bilim*, 44(200). https://doi.org/10.15390/EB.2019.8090

Büyüköztürk, Ş., Kılıç-Çakmak, E., Akgün, Ö., Karadeniz, Ş., & Demirel, F. (2022). *Eğitimde bilimsel araştırma yöntemleri. [Scientific research methods].* (32nd ed.). Ankara:Pegem Akademi.

Büyüköztürk, Ş., Akgün, Ö. E., Özkahveci, Ö., & Demirel, F. (2004). Güdülenme ve öğrenme stratejileri ölçeğinin türkçe formunun geçerlik ve güvenirlik çalışması. [The validity and reliability study of the Turkish version of the motivated strategies for learning questionnaire]. *Kuram ve Uygulamada Eğitim Bilimleri*, 4(2), 207-239. Retrieved April 12, 2024 from https://www.researchgate.net/profile/Oezcan-Akguen/publication/279175043_Gudulenme_ve_Ogrenme_Stratejileri_Olceginin_Turkce_Formunun_Gecerlik_ve_Guvenirlik_Calismasi/links/5c248bea458515a4c7fb2fae/Gueduelenme-ve-Oegrenme-Stratejileri-Oelceginin-Tuerkce-Formunun-Gecerlik-ve-Guevenirlik-Calismasi.pdf

Can Göl, R. (2023). *Güzel sanatlar lisesi ile diğer liselerde öğrenim gören öğrencilerin 21.yy becerileri-kariyer özyeterliği ve kaygısı düzeylerinin karşılaştırılması ve sanatla ilgili mesleklere ilişkin görüşleri. [Comparison of 21st century skills, career self-efficacy and anxiety levels of students studying at fine arts high school and other high schools; and their opinions on art-related professions].* Unpublished master's thesis. Pamukkale Üniversitesi, Denizli.

Cansoy, R. (2018). Uluslararası çerçevelere göre 21. yüzyıl becerileri ve eğitim sisteminde kazandırılması. [21st century skills according to international frameworks and building them in the education system]. *İnsan ve Toplum Bilimleri Araştırmaları Dergisi*, 7(4), 3112-3134. https://doi.org/10.15869/itobiad.494286

Cırcır, O., Uzun, K., Tagay, O., & Gönültaş, O. (2024). Ergenlerde kariyer kaygısının mükemmeliyetçilik ve çeşitli demografik değişkenlerce yordanabilirliğinin incelenmesi. [Prediction of the career anxiety in adolescents through perfectionism and varius demographic variables]. *Mehmet Akif Ersoy Üniversitesi Eğitim Fakültesi Dergisi* (69), 52-79. https://doi.org/10.21764/maeuefd.1358105

Coşkun, S., & Bebiş, H. (2015). Adolesanlarda e-sağlık okuryazarlığı ölçeği: Türkçe geçerlik ve güvenirlik çalışması. [E-health literacy scale in adolescents: Turkish Validity and reliability study]. *Gülhane Tıp Dergisi*, 57(4), 378-384. Retrieved April 5, 2024 from https://www.researchgate.net/profile/Sabahat-Coskun/publication/349716744_adolesanlarda-e-saglik-okuryazarligi-olcegi-toad/links/603e4931299bf1e0784f9312/adolesanlarda-e-saglik-okuryazarligi-olcegi-toad.pdf

Cui, Z., Oshri, A., Liu, S., Smith, E. P., & Kogan, S. M. (2020). Child maltreatment and resilience: The promotive and protective role of future orientation. *Journal of youth and adolescence*, 49, 2075-2089. Retrieved April 7, 2024 from https://link.springer.com/article/10.1007/s10964-020-01227-9

Çalışkan, S., & Dilmaç, B. (2021). Ergenlerin sahip olduğu gelecek beklenti, umut ve psikolojik iyi oluş arasındaki yordayıcı ilişkiler. [Predictive relationships between adolescents' future expectation, hope and psychological well-being]. *Necmettin Erbakan Üniversitesi Ereğli Eğitim Fakültesi Dergisi*, 3(2), 131-143. https://doi.org/10.51119/ereegf.202216

Çelik, B. S. (2021). *Lise öğrencilerinin 21. yüzyıl becerilerini algılama düzeylerinin incelenmesi. [Investigation of high school students' 21st century skills perception levels].* Unpublished master's thesis. Biruni Üniversitesi, Eğitim Bilimleri Enstitüsü.

Çetin Gündüz, H., & Nalbantoğlu Yılmaz, F. (2016). Lise öğrencilerinin kariyer kaygılarını belirlemeye yönelik ölçek geliştirme çalışması. [Scale development study for determining the career anxiety of high school students]. *Mersin Üniversitesi Eğitim Fakültesi Dergisi,* 12(3), 1008-1022. https://doi.org/10.17860/mersinefd.282397

Çevik, M. & Şentürk C. (2019). Multidimensional 21th century skills scale: Validity and reliability study. *Cypriot Journal of Educational Sciences*. 14(1), 011–028. Retrieved April 8, 2024 from https://files.eric.ed.gov/fulltext/EJ1211726.pdf

Demir, S., & Çolakkadıoğlu, O. (2023). Lise öğrencilerinde gelecek vizyonlarının yordanmasında yaşam doyumu ve akılcı olmayan inançların rolü. [The role of life satisfaction and irrational beliefs in prediction of visions about future among high school students]. *Korkut Ata Türkiyat Araştırmaları Dergisi* (12), 1234-1248. https://doi.org/10.51531/korkutataturkiyat.1350920

Di Maggio, I., Ginevra, M. C., Nota, L., & Soresi, S. (2016). Development and validation of an instrument to assess future orientation and resilience in adolescence. *Journal of adolescence*, 51, 114-122. https://doi.org/10.1016/j.adolescence.2016.06.005

Doğanülkü, H. A., & Güneşlice, A. (2022). The moderating role of career decision regret in the relationship between visions about the future and proactive career behaviors: Turkey sample. *Ekev Akademi Dergisi* (91), 75-91. https://doi.org/10.17753/sosekev.1107761

Dönmezer, İ. (2003). Ergenlik döneminde özerkleşme/bağımsızlaşma. [Autonomy/independence during adolescence]. *Sosyoloji Dergisi*, (10). https://dergipark.org.tr/en/download/article-file/593224

Dursun, Y., & Kocagöz, E. (2010). Yapısal eşitlik modellemesi ve regresyon: karşılaştırmalı bir analiz. [Structural equation modeling and regression: a comparative analysis]. *Erciyes Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi* (35), 1-17. https://dergipark.org.tr/en/download/article-file/66557

Engin, A. O., & Korucuk, M. (2021). Öğrencilerin 21. yüzyıl becerilerinin çeşitli değişkenler açısından incelenmesi. [Investigation of students' 21st century skills in terms of various variables]. *Gazi Üniversitesi Gazi Eğitim Fakültesi Dergisi*, 41(2), 1081-1119. https://doi.org/10.17152/gefad.875581

Erstad, O. (2010). The assessment and teaching of 21st century skills project. *Nordic Journal of Digital Literacy*, 4(3-4), 204-211. https://doi.org/10.18261/ISSN1891-943X-2009-03-04-07

Fusco, L., Sica, L. S., Boiano, A., Esposito, S., & Aleni Sestito, L. (2019). Future orientation, resilience and vocational identity in southern Italian adolescents. *International Journal for Educational and Vocational Guidance*, 19, 63-83. https://doi.org/10.1007/s10775-018-9369-2

George, D., & Mallery, M. (2010). SPSS for windows step by step: A Simple guide and reference, 17.0 update (10th ed.) Boston: Pearson

Ginevra, M. C., Santilli, S., Di Maggio, I., Nota, L., & Soresi, S. (2020). Development and validation of visions about future in early adolescence. *British Journal of Guidance & Counselling*, 48(2), 155-167. https://doi.org/10.1080/03069885.2018.1550188

Ginevra, M. C., Annovazzi, C., Santilli, S., Di Maggio, I., & Camussi, E. (2018). Breadth of vocational interests: The role of career adaptability and future orientation. *The Career Development Quarterly,* 66(3), 233-245. https://doi.org/10.1002/cdq.12145

Ginevra, M., C., Sgaramella, T., M., Ferrari, L., Nota, L., Santilli, S. & Soresi, S. (2017). Visions about future: A new scale assessing optimism, pessimism, and hope in adolescents. *International Journal for Educational and Vocational Guidance* 17 (2), 187-210. https://doi.org/10.1007/s10775-016-9324-z

Göncü Akbaş, M., & Okutan, E. (2020). Lise öğrencilerinin kariyer kaygısına yönelik alan araştırması: Antalya ili örneği. [Career anxiety in high school students: A case study]. *Gençlik Araştırmaları Dergisi*, 8(20), 158-187. https://dergipark.org.tr/en/download/article-file/1164722

Guichard, J. (2015). From vocational guidance and career counselling to life design dialogues. In L. Nota, & J. Rossier (Eds.*), Handbook of life design: From practice to theory, from theory to practice* (pp. 1-25). Hogrefe Publishing. Retrieved April 9, 2024 from https://www.researchgate.net/publication/274313627_The_life_Design_paradigm_from_practice_to_theory

Hagen, K. A., Myers, B. J., & Mackintosh, V. H. (2005). Hope, social support, and behavioral problems in at-risk children. *American journal of orthopsychiatry*, 75(2), 211-219. https://doi.org/10.1037/0002-9432.75.2.211

Hartung, P. J., Porfeli, E. J., & Vondracek, F. W. (2005). Child vocational development: a review and reconsideration. *Journal of Vocational Behavior,* 66, 385–419. https://doi.org/10.1016/j.jvb.2004.05.006

Hirschi, A., & Dauwalder, J.-P. (2015). Dynamics in career development: Personal and organizational perspectives. In L. Nota & Rossier, R. (Eds.), *Handbook of the Life Design paradigm: From practice to theory, from theory to practice* (pp.27-39). Boston, MA: Hogrefe. Retrieved April 10, 2024 from https://www.researchgate.net/publication/279850299_Dynamics_in_Career_Development_Personal_and_Organizational_Perspectives

Iowa Core (2010). *K-12 21st century skills*. Essential concepts and skills with details and examples. Retrieved March 31, 2024 from https://educate.iowa.gov/media/217/download?inline

ISTE. (2017). *ISTE Standards*. International society for technology in education. Retrieved March 30, 2024 from https://iste.org/standards/students

Işık, E. (2014). Çocuk kariyer gelişimi ile yaşam doyumu ve durumluk kaygı arasındaki ilişkilerin incelenmesi. [Relationship of childhood career development to life satisfaction, and state anxiety]. *Elementary Education Online,* 13(2), 682-693. Retrieved April 12, 2024 from https://www.researchgate.net/profile/Erkan-Isik-2/publication/286309654_Relationship_of_childhood_career_development_to_life_satisfaction_and_state_anxiety/links/576e910108ae0b3a3b79cabb/Relationship-of-childhood-career-development-to-life-satisfaction-and-state-anxiety.pdf

İmamoğlu, E. O., & Güler-Edwards, A. (2007). Geleceğe ilişkin yönelimlerde benlik tipine bağlı farklılıklar. [Self-related differences in future time orientations]. *Türk Psikoloji Dergisi,* 22(60), 115-132. Retrieved April 4, 2024 from http://www.tpd.com.tr/tr/yayinlar/dergiler/1031828/tpd1300443320070000m000145.pdf

Jia, Y., Hou, Z.-J., & Shen, J. (2022). Adolescents' future time perspective and career construction: Career adaptability as mediator and hope as moderator. *Journal of Career Development*, *49*(1), 202-217. https://doi.org/10.1177/0894845320926579

Kablay, S. (2021). Stajyer öğrencilerin emek süreçleri: Meslek liseleri üzerine niteliksel bir araştırma. [Labour processes of ınternship students: a qualitative research on vocational high schools]. *Politik Ekonomik Kuram*, 5(1), 132-160. https://doi.org/10.30586/pek.943297

Kanwal, S., & Choudhary, F. R. (2023). A Gender wise comparison of 21st century skills of secondary school learners. *Journal of Educational Research and Social Sciences Review (JERSSR)*, 3(2), 147-153. Retrieved April 15, 2024 from https://ojs.jerssr.org.pk/index.php/jerssr/article/download/224/114

Karacan Özdemir, N., & Ayaz, A. (2020). Okul psikolojik danışma ve rehberlik programları: Kariyer uyum yetenekleri açısından bir inceleme. [School counseling and guidance programs: examination of career adaptabilities]. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi*, 35(3), 613-626. https://doi.org/10.16986/HUJE.2018045437

Karasar, N. (2009). *Bilimsel araştırma yöntemi: Kavramlar-ilkeler-teknikler. [Scientific research method].* (20th ed.). Ankara:Nobel Yayıncılık.

Kayadibi, S., & Kırdök, O. (2020). Lise öğrencilerinin kariyer kaygıları ile beş faktör kişilik özellikleri arasındaki ilişkinin incelenmesi. [A study on the relationship between high school students' big fıve personality traits and career anxiety]. *Avrasya Sosyal ve Ekonomi Araştırmaları Dergisi,* 7(5), 372-388. https://dergipark.org.tr/en/download/article-file/1128126

Keskin, R., & Pakdemirli, M. N. (2016). Mesleki aidiyet ölçeği: Bir ölçek geliştirme, geçerlilik ve güvenirlik çalışması. [Vocational belonging scale: A study of developing a valid and reliable scale]. *Journal Of International Social Research*, 9(43). 2580-2587. Retrieved April 15, 2024 from https://www.academia.edu/download/72220221/52089cde1bdeea26c68dc706aa5ddf29ee66.pdf

Koca, D. (2020). Sanayi Devrimlerinin Tarihsel Arka Planı ve İşgücü Becerileri Üzerindeki Yansımaları. [The historical background of industrial revolutions and their reflections on workforce skills]. *OPUS International Journal of Society Researches,* 16(31), 4531-4558. https://doi.org/10.26466/opus.704841

Konate, A. D. (2022). *Meslek lisesi öğrencilerinin 21. yy. becerileri ve umut düzeylerinin kariyer karar verme güçlüğü ile ilişkisinin incelenmesi. [Investigation of the relationship between vocational high school students' 21st century skills and hope levels with career decision making difficulty].* Unpublished master's thesis. Ufuk Üniversitesi, Ankara.

Konidari, V., & Benetton, M. (2019). Adolescents' perceptions of future planning in Italy, France and Greece: Dimensions of time and disadvantage. *Studium educationis-Rivista semestrale per le professioni educative*, (3), 7-24. Retrieved April 16, 2024 from https://ojs.pensamultimedia.it/index.php/studium/article/download/3622/3335

Korkmaz, O. (2023). "Visions about future: Hope, optimism, and pessimism" as predictor of university students' proactive career behavior", *International Academic Social Resources Journal,* Vol:8, Issue:45; pp:1914-1922. http://dx.doi.org/10.29228/ASRJOU RNAL.67583

Korkmaz, O., & Kırdök, O. (2022). Kariyer yapılandırma kuramına göre geliştirilen kariyer müdahale programının etkililiğinin incelenmesi. [Investigation of the effectiveness of career intervention program based on career construction theory]. *Türk Eğitim Bilimleri Dergisi*, 20(1), 230-255. https://doi.org/10.37217/tebd.1037359

Makarova, E., Aeschlimann, B., & Herzog, W. (2019). The gender gap in STEM fields: The impact of the gender stereotype of math and science on secondary students' career aspirations. *Front. Educ*. 4:60. https://doi.org/10.3389/feduc.2019.00060

Mello, Z. R., Finan, L. J. & Worrell, F. C. (2013). Introducing an instrument to assess time orientation and time relation in adolescents. *Journal of Adolescence*, 36,551–563. https://doi.org/10.1016/j.adolescence.2013.03.005

Nalbantoğlu Yılmaz, F., & Çetin Gündüz, H. (2018). Lise öğrencilerinin kariyer kaygılarının çeşitli değişkenlere göre incelenmesi. [Investigation of career anxiety of high school students according to various variables]. *Abant İzzet Baysal Üniversitesi Eğitim Fakültesi Dergisi,* 18(3), 1585-1602. https://doi.org/10.17240/aibuefd.2018.18.39790-471164

Nurmi, J. E. (1991). How do adolescents see their future? A review of the development of future orientation and planning. *Developmental Review*, 11(1), 1-59. https://doi.org/10.1016/0273-2297(91)90002-6

Önür, Z., & Kozikoğlu, İ. (2019). Ortaokul öğrencilerinin 21. yüzyıl öğrenme becerileri. [Secondary school students' 21st century learning skills]. *Trakya Eğitim Dergisi,* 9(3), 627-648. https://doi.org/10.24315/tred.528501

Özdemir, Y., & Çok, F. (2011). Ergenlikte Özerklik Gelişimi. [Autonomy development in adolescence]. *Turkish Psychological Counseling & Guidance Journal*, 4(36). Retrieved April 15, 2024 from https://eds.p.ebscohost.com/eds/pdfviewer/pdfviewer?vid=0&sid=c0c56a01-039f-41b1-86ef-92b7ee8f4324%40redis

Öztürk, Ö.T. (2023). Examination of 21st century skills and technological competences of students of fine arts faculty. *International Journal of Education in Mathematics, Science and Technology (IJEMST)*, 11(1), 115-132. https://doi.org/10.46328/ijemst.2931

Partnership for 21st Century Skills (2009). A. framework for 21st century learning. Tuc-son: AZ: P21. Retrieved March 30, 2024 from https://files.eric.ed.gov/fulltext/ED519462.pdf

Samancı, F. T. (2023). *Ortaöğretim öğrencilerinin olumlu ve olumsuz mükemmeliyetçilik özellikleri ile gelecek beklentisi ve kariyer kaygısı ilişkisinin incelenmesi. [Examination of the relationship between positive and negative perfectionism features and future expectations and career anxiety of secondary students].* Unpublished master's thesis. Selçuk Üniversitesi, Konya.

Savickas, M. L., Nota, L., Rossier, J., Dauwalder, J. P., Duarte, M. E., Guichard, J., ... & Van Vianen, A. E. (2009). Life Designing: A paradigm for career construction in the 21st century. *Journal of Vocational Behavior*, 75(3), 239-250. http://doi.org/10.1016/j.jvb.2009.04.004

Scheir, M. F., Carver, C. S., & Bridges, M. W. (1994). Distinguishing optimism from neuroticism (and trait anxiety, self-mastery, and self-esteem): A reevaluation of the Life Orientation Test). *Journal of Personality and Social Psychology,* 67, 1063-1078. Retrieved April 20, 2024 from https://www.cmu.edu/dietrich/psychology/pdf/scales/LOTR_article.pdf

Segerstrom, S.C., Carver, C.S., & Scheier, M.F. (2017). Optimism. In *The Happy Mind: Cognitive Contributions to Well-Being*; Robinson, M.D., Eid, M., Eds.; Springer International Publishing: Cham, Switzerland, 2017; pp. 195–212. Retrieved April 25, 2024 from https://link.springer.com/chapter/10.1007/978-3-319-58763-9_11

Sevinç, A., & Siyez, D. M. (2018). Öğrenci kariyer yapılandırma envanteri'nin Türkçe uyarlaması: Geçerlik ve güvenirlik çalışması. [Adaptation of the student career construction inventory into Turkish: A validity and reliability study]. *İş ve İnsan Dergisi*, 5(2), 157-168. https://doi.org/10.18394/iid.349410

Shoshana, A. (2020). "I live one day at a time": Future orientation among Muslim high school dropouts in Israel. *Children and Youth Services Review*, 119, 105605. https://doi.org/10.1016/j.childyouth.2020.105605

Soruklu, E., & Şentürk, Ş. (2023). Öğretmen adaylarının 21. yüzyıl becerileri ile yaşam boyu öğrenme eğilimlerinin incelenmesi. [Examining the 21st century skills and lifelong learning tendencies of prospective teachers]. *Uluslararası Eğitim Bilimleri Dergisi*, 10 (35), 167-192. http://dx.doi.org/10.29228/INESJOURNAL.66178

Şama, H. (2020). *Ergenlerin kariyer kaygısını yordamada aile desteği ve umudun rolü. [The role of family support and hope in predicting career anxiety of adolests].* Unpublished master's thesis. Yıldız Teknik Üniversitesi, İstanbul.

Şeker, A. (2020). Toplumsal cinsiyet eşitsizliğinin irrasyonelliği ve kamusal alandaki yansımaları. [Irrationality of gender ınequality and reflections in the public sphere]. *Current Research in Social Sciences*, 6(2), 92-102. https://doi.org/10.30613/curesosc.651457

Şimşek, H., Ünal, M., Erbay Mermer, Ş., & Özaslan, D. (2022). Lise öğrencilerinde gelecek beklentisi ve öz güven ilişkisi. [The relationship between future expectation and self confidence of high school students]. *Van Yüzüncü Yıl Üniversitesi Eğitim Fakültesi Dergisi,* 19(Özel Sayı), 387-409. https://doi.org/10.33711/yyuefd.1068626

Tabachnick, B.G. & Fidell, L.S. (2013). Using Multivariate Statistics (sixth ed.) Pearson, Boston.

Tamar, M., & Özbaran, B. (2004). Çocuk ve ergenlerde depresyon. [Depression in children and adolescents]. *Klinik Psikiyatri*, 2(1), 84-92. Retrieved April 7, 2024 from https://jag.journalagent.com/z4/download_fulltext.asp?pdir=kpd&plng=eng&un=KPD-53753

Taş, M. A., & Özmen, M. (2019). Meslek seçiminde aile desteği ve kariyer uyum yetenekleri ilişkisi: Olumlu gelecek beklentisinin aracılık rolü. [The relationship between family support in the choice of vocation and career adaptability: the mediatory role of the positive future expectation]. *Avrasya Uluslararası Araştırmalar Dergisi*, 7(16), 736-761. https://doi.org/10.33692/avrasyad.543865

Temurtaş, R. (2022). *Lise öğrencilerinin gelecek yönelimi ve kariyer uyumu ilişkisinde meslek kararı verme öz yetkinliği aracı rolü. [The mediating role of career decision-making selfefficacy in the relationship between future orientation and career adaptability in high school students].* Unpublished master's thesis. Çukurova Üniversitesi, Adana.

Toker, B., & Kalıpçı, M. B. (2021). Benlik saygısı, olumlu gelecek beklentisi ve geleceğe yönelik tutumun mutluluk üzerindeki etkisi: Meslek yüksekokulu öğrencileri üzerinde bir uygulama. [The effect of self-esteem, positive future expectation and attitude toward future on happiness: An analysis of vocational school students].*Yükseköğretim Dergisi*, 11(2 Pt 2), 473-484. https://doi.org/10.2399/yod.21.578916

Topçuoğlu, S. (2023). Ergenlerde duygu regülasyonu. [Emotion regulation in adolescents]. *İnteraktif Bilim: Disiplinlerarası Araştırma ve İncelemeler Dergisi,* 1(2), 10-49. https://doi.org/10.61749/JIRAS-8.10-49

Trommsdorff, G. (1986). Future time orientation and its relevance for development as action. In *Development as action in context: Problem behavior and normal youth development* (pp. 121-136). Berlin, Heidelberg: Springer Berlin Heidelberg. Retrieved April 15, 2024 from https://kops.uni-konstanz.de/bitstreams/a7c47cbb-a193-4a14-aaa5-6f26b44df878/download

Trommsdorff, G., Lamm H., & Schmidt, R. W. (1979). A Longitudinal study of adolescents' future orientation (time perspective). *Journal of Youth and Adolescence*, 8, pp. 131-147. Retrieved April 15, 2024 from https://kops.uni-konstanz.de/bitstream/handle/123456789/10182/A_longitudinal_study_of_adolescents_1979_KOPS8514.pdf?sequence=1

TTKB [The Ministry of National Education Board of Education and Training]. (2017). *Müfredatta yenileme ve değişiklik çalışmalarımız üzerine. [Curriculum renewal and change efforts].* Ankara. Retrieved April 2, 2024 from https://saraykent.meb.gov.tr/meb_iys_dosyalar/2017_09/05164224_TanYtYm_KitapYY.pdf

TÜSİAD [Turkish Industry and Business Association]. (1999). *Türkiye'de mesleki ve teknik eğitimin yeniden yapılandırılması. [Restructuring of vocational and technical education in Turkey].* İstanbul: Lebib Yalkın Yayımları. Retrieved April 1, 2024 from https://tusiad.org/tr/yayinlar/raporlar/item/1852-turkiyede-mesleki-ve-teknik-egitimin-yeniden-yapilandirilmasi

Türel, Y. K., Şimşek, A., Şengül Vautier, C. G., Şimşek, E., & Kızıltepe, F. (2023). *21. yüzyıl becerileri ve değerlere yönelik araştırma raporu. [Research report on 21st century skills and values].* Ankara: Talim ve Terbiye Kurulu Başkanlığı. Retrieved March 26, 2024 from https://ttkb.meb.gov.tr/meb_iys_dosyalar/2023_05/11153521_21.yy_becerileri_ve_degerlere_yonelik_arastirma_raporu.pdf

Valtonen, T., Hoang, N., Sointu, E., Näykki, P., Virtanen, A., Pöysä-Tarhonen, J., ... & Kukkonen, J. (2021). How pre-service teachers perceive their 21st-century skills and dispositions: A longitudinal perspective. *Computers in Human Behavior*, 116, 106643. https://doi.org/10.1016/j.chb.2020.106643

Varki, E. (2020). *Öğretmen adaylarının çok boyutlu 21. yüzyıl becerileri ile yaratıcı düşünme eğilimlerinin incelenmesi. [Investigation of prospective teachers 'tendencies about 21 st century skills and creative thinking trends].* Unpublished master's thesis. Kahramanmaraş Sütçü İmam Üniversitesi, Kahramanmaraş.

Wilks, J. (1986). The relative importance of parents and friends in adolescent decision making. *Journal of Youth and Adolescence*, 15(4), 323-334. https://doi.org/10.1007/BF02145729

Yavrutürk, A. R. (2023). Fen lisesi son sınıf öğrencilerinin kariyer kaygıları ile ilgili görüşlerinin incelenmesi. [Reviewing of Science High School Final Year Students' Opinions on Occupational Anxiety]. *Uluslararası Karamanoğlu Mehmetbey Eğitim Araştırmaları Dergisi*, 5(1), 1-11. https://doi.org/10.47770/ukmead.1217778

Yayla, İ. E. (2023). *Lise öğrencilerinde kariyer kaygısı ile mükemmeliyetçilik ve benlik saygısı düzeyleri arasındaki ilişki. [The relationship between career anxiety, perfectionism, and self-esteem levels in high school students].* Unpublished master's thesis. Sakarya Üniversitesi, Sakarya.

Yeşildal, M., Erişen, M., & Kıraç, R. (2020). Sağlık sistemlerine güvensizlik: Bir geçerlilik ve güvenilirlik çalışması. [Health care system distrust: A study of validity and reliability]. *Uluslararası Sağlık Yönetimi ve Stratejileri Araştırma Dergisi,* 6(2), 251-259. https://dergipark.org.tr/en/download/article-file/1260858

Yıldırım Kurtuluş, H., Kurtuluş, E., & Yaman, K. G. (2022). Ergenlerin Benlik Saygısı İle Kariyer Kaygısı Arasındaki İlişki: Gelecek Beklentisinin Aracı Rolü. [The relationship between self-esteem and career anxiety of adolescents: the mediating role of future expectation]. *Ekev Akademi Dergisi,* (90), 283-302. https://dergipark.org.tr/en/download/article-file/2551462

Zeng, Q., He, Y., Li, J., Liang, Z., Zhang, M., Yi, D., & Quan, J. (2022). Hope, future work self and life satisfaction among vocational high school students in China: The roles of career adaptability and academic self-efficacy. *Personality and Individual Differences*, 199, 111822. https://doi.org/10.1016/j.paid.2022.111822

Zeybek, G. (2019). Lise öğrencilerinin 21. yüzyıl öğrenme becerileri kullanım düzeylerinin belirlenmesi. [Determination of level of 21st century learner skills use of high school students]. *International Journal of Social Sciences and Education Research*, 5(2), 142-156. https://doi.org/10.24289/ijsser.505263

Zeybekoğlu Akbaş, Ö., & Dursun, C. (2020). Teknolojinin aileye etkisi: Değişen ailenin dijital ebeveyn ve çocukları. [The impact of technology on the family: Digital parent and children of the changing family]. *Turkish Studies - Social*, 15(4), 2245-2265. https://dx.doi.org/10.29228/TurkishStudies.43395