



# RELATIONSHIPS AMONG INDIVIDUAL ENTREPRENEURIAL ORIENTATION, CULTURAL MOTIVATION, AND ANALYTICAL THINKING SKILLS

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## Abstract

*The cultural structure of society is seen as an important factor among the characteristics that shape entrepreneurship traits. The dominant culture in society also influences individuals' ways of thinking and the characteristics of individuals raised through education systems. In individualistic societies where personal preferences take precedence, independent thinking and creativity are encouraged, while in collectivist cultures, cooperation and harmony are prioritized. In this context, it is evident that factors that may directly or indirectly influence entrepreneurial traits, including cultural characteristics as well as higher-order thinking skills, should be examined. This study aimed to examine the predictive relationships between upper-secondary vocational students' entrepreneurial orientations, cultural motivation, attention to detail, and analysis skills using structural equation modeling. A predictive research model was used in the study. The sample of the study consists of 454 upper-secondary vocational students. "Individual Entrepreneurial Orientation Scale", "Analytical Thinking Scale," and "Cultural Awareness Scale" were used to collect the data. Confirmatory factor analysis and path analysis were used to analyze the data. It was determined that cultural motivation is a variable that positively predicts entrepreneurial orientation at a moderate level. Attention to detail and analysis skills are variables that positively and moderately predict entrepreneurial orientation. In terms of the effect of cultural motivation on entrepreneurial orientation, it was found that attention to detail and analysis skills are partial mediating variables, with the indirect effects being relatively low. These results indicate that there is a need for activities that integrate entrepreneurship studies in upper-secondary schools with cultural characteristics and thinking skills.*

**Keywords:** analysis skill, attention to detail skill, cultural motivation, individual entrepreneurial orientation, vocational upper-secondary students

## Introduction

Social characteristics are constantly changing and evolving in line with the needs of the age. In particular, it is stated that innovative entrepreneurs are the leading actors of change and development with the transition from an industrial society to an information society (Özkul, 2008). Entrepreneurial individuals increase employment through their entrepreneurial activities, thereby making significant contributions to the country's economic development. This situation also ensures an increase in the level of social welfare and quality of life (Karagöz, 2016; Kaya, 2017). For this reason, the need to educate individuals with entrepreneurial characteristics is becoming more important every day.

The growing importance of entrepreneurship in the information society has brought 21st-century skills to the forefront as characteristics to be acquired through education systems (Nalbantoğlu, 2021; Trilling & Fadel, 2009). The Partnership structures the most widely accepted classification of skills in the field of education for 21st-century skills. The skills included in this framework, such as problem solving, innovation, creativity, flexibility and adaptability, collaboration and communication, leadership, and social and cultural interaction, support entrepreneurial characteristics (P21, 2019). In general, the characteristics that distinguish entrepreneurs from other individuals in society include being culturally aware, open to innovation and change opportunities, productive, initiative-taking and risk-taking, creative, and analytical thinkers (Asar, 2021; Korkmaz, 2022; Vocational Qualifications Authority of Türkiye [VQA], 2015).

The 21st century is seen as a period of significant developments in scientific, technological, social, and cultural fields (Korkmaz, 2022). In this context, education systems that aim to educate entrepreneurial individuals must consider the socio-cultural dynamics that shape individuals' perceptions, decisions, and behaviors (Craig & Douglas, 2006; Foscht et al., 2008). This is because it is stated that cultural structure, which influences perspectives on entrepreneurship, is a significant factor in the differences in entrepreneurial potential among societies (Demirel & Tikici, 2004). The socio-cultural differences of societies also affect the personality traits and lifestyles of individuals (Castillo-Palacio et al., 2017; Çarıkçı & Koyuncu, 2010; Eryılmaz, 2019), and therefore, the entrepreneurial potential of societies varies (Müftüoğlu & Durukan, 2004; Thomas & Mueller, 2000). Thus, entrepreneurship should not be limited to its economic dimension but should be considered as a concept that shapes the social and cultural structure (Demirel & Tikici, 2004).

### *Cultural Motivation in the Development of Entrepreneurial Traits*

In the literature, the development of entrepreneurial traits is associated with concepts such as cultural awareness and cultural intelligence (CQ), in addition to individual competencies (Bigomba, 2024; Oladipo et al., 2025). Cultural awareness is an entrepreneur's ability to understand norms, values, and ways of conducting business in different cultural contexts and to transform this knowledge into a strategic advantage (Bigomba, 2024). This competency plays a decisive role in recognizing cultural contexts and opportunities, managing risks, and promoting sustainable practices in the globalizing business world (Baron & Shane, 2005; Güney & Çetin, 2003). Motivation, one of the dimensions that constitute cultural awareness and cultural intelligence, is the fundamental source that supports individuals' desire to reflect their knowledge of cultural and intercultural contexts. This motivation increases the individual's effort to adapt effectively to cultural environments and function within them (Dinç, 2020). Hofstede's (1980) theory of cultural dimensions argues that the elements of "individualism" and "uncertainty avoidance" in particular directly influence entrepreneurial orientation. It has been demonstrated that cultures with low levels of uncertainty avoidance exhibit higher levels of innovation and risk-taking (Shane, 1993). Similarly, while independent thinking and creativity are encouraged in individualistic cultures, cooperation and harmony are prioritized in collectivist cultures (Chatman et al., 2014). In this process, cultural motivation reduces the individual's fear of making mistakes and increases their courage to implement innovative ideas (Mueller & Thomas, 2001; Shane, 1993). Therefore, it is evident that cultural motivation plays a crucial role in the development of independent, innovative, and creative thinking skills that support the entrepreneurial process (Chatman et al., 2014; Choi et al., 2007).

### *Analytical Thinking in the Development of Entrepreneurial Traits*

The entrepreneurial process is not limited to the act of starting a new business, but also encompasses competencies such as being able to make strategic decisions in uncertain situations and systematically evaluate opportunities (Linton, 2019). At the center of this process is the entrepreneurial orientation, which refers to an organization's or individual's tendency to exhibit innovation, risk-taking, and proactive behavior (Miller, 1983). However, the cognitive processes underlying these tendencies are directly related to how the entrepreneur processes information, analyzes problems, and generates meaningful strategies from complex data sets (Dess & Lumpkin, 2005). Analytical thinking, which is related to creativity and innovation processes, is one of the fundamental cognitive skills that supports the development of strategies necessary for entrepreneurial orientation. The analytical thinking process consists of the following stages: breaking down a whole into parts, establishing relationships between the parts, and evaluating the relationship between the parts and the whole in light of the information obtained (Brookhart, 2010). Through the analytical thinking skills used in this process, problems are identified in uncertain situations, and different solutions to the problem are generated. Analytical thinkers tend to examine situations in detail and carefully during the problem-solving process by questioning them (Ocak & Akkaş-Baysal, 2021). The problem-solving skill required in this process plays a key role in transforming abstract ideas into concrete business models. It has been determined that the analytical thinking process plays an important role in systematically developing the innovations required in the entrepreneurial process, making uncertainty measurable by taking calculated risks, and predicting possible future demands (Drucker, 1985; Lumpkin & Dess, 1996; Venkatraman, 1989). At this point, it can be said that analytical thinking skills are a cognitive mechanism that acts on the dimensions of innovation, risk-taking, and proactivity of entrepreneurial orientation. This shows that analytical thinking skills are among the characteristics that can be considered fundamental competencies for distinguishing whether an individual is entrepreneurial or not (Wu, 2009). Consequently, it has been determined that, in addition to cultural motivation, analytical thinking skills should also be examined as an important variable among the factors affecting entrepreneurial traits.

In the literature, researchers' classifications of analytical thinking skills vary. According to Facione (1990), analytical thinking includes the skills of interpreting information, identifying similarities and differences in the information presented, developing hypotheses, and explaining conceptual relationships. Another classification includes core skills such as analyzing, organizing, sorting, subdividing, comparing, establishing relationships, explaining situations, and reaching conclusions (Güneş, 2012). Similarly, according to Sternberg (2005), analytical thinking skills consist of the abilities to analyze a situation, evaluate it, explain it, compare it, and make judgments. In the structure of the measurement tool used in this study, the skills that constitute analytical thinking are classified as "assimilation, attention to details, analyzing, and working strategies" (Ocak & Park, 2020).

### *The Need for Research*

In the literature, entrepreneurial characteristics have been examined in terms of critical, creative, innovative, and reflective thinking skills (Barnard & Herbst, 2019; Choi et al., 2007; Gönül, 2023; Gözübüyük, 2019; Henrich, 2014; Kılıçoğlu & Yıldırım, 2023; Nisbett et al., 2001; Yeşilbaş, 2024). Other studies have focused on the relationship between entrepreneurship and cultural characteristics (Audretsch, 2020; Facchini et al., 2021; Lounsbury et al., 2019; Ölmez, 2024; Treviño, 2020; Uluçay & Yazıcı, 2023; Yıldırım & Sunman, 2020). In this context, although studies have focused on the relationships between cultural characteristics, thinking skills, and entrepreneurial characteristics, no research has been found that proposes

a model for the possible relationships between these variables. This situation has been identified as a significant gap in the literature, and upper-secondary vocational students have been recognized as one of the groups with high entrepreneurial potential.

This study aimed to examine the predictive relationships between upper-secondary vocational students' entrepreneurial orientations, cultural motivation, attention to detail, and analysis skills using structural equation modeling. To examine the effect of cultural motivation on entrepreneurial orientation through attention to detail and analysis skills, two different models presented in Figures 1 and 2 were tested.

**Figure 1**

*First Hypothetical Model Regarding Entrepreneurial Orientation*

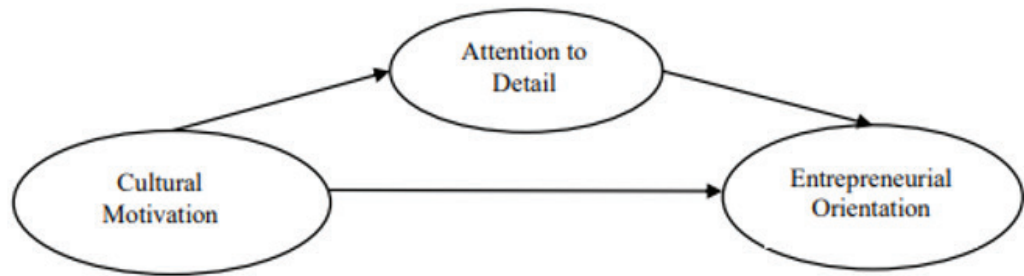
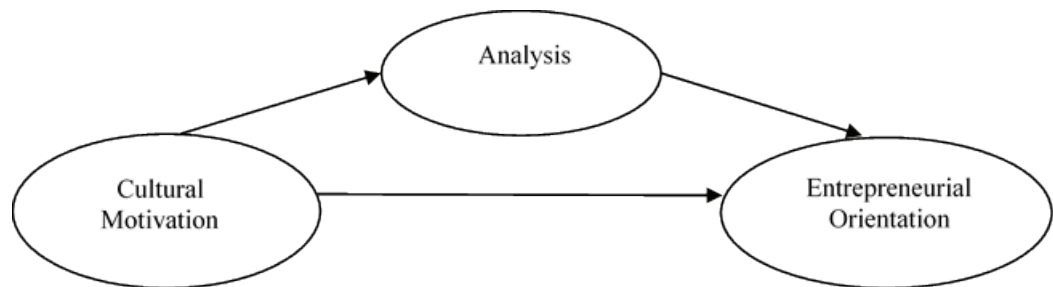


**Figure 2**

*The Second Hypothetical Model Regarding Entrepreneurial Orientation*



In order to test the proposed hypothetical models, answers were sought to the following research questions.

- Does cultural motivation predict entrepreneurial orientation to a significant level through the attention to detail skill?
- Does cultural motivation predict entrepreneurial orientation to a significant level through the analysis skill?

The results obtained from this research are expected to contribute to the identification of factors that affect the entrepreneurial characteristics of upper-secondary vocational students. The results of the research on the structural relationships between entrepreneurial orientation, cultural motivation, and analytical thinking skills are expected to provide essential contributions to curriculum developers in the development of upper-secondary curricula, taking into account the relevant variables.

## Research Methodology

### *Model*

A predictive research model was used in the study. In predictive research, relationships between variables are explained, and predictions about the dependent variable are made based on the independent variables. In this process, cause-and-effect relationships are presented within a model, and depending on the structure of the data, these models can be implemented using different methods (Çokluk et al., 2012). In this study, the causal relationships between individual entrepreneurial orientation, cultural motivation, attention to detail, and analysis variables were examined using structural equation modeling. Regression analysis; path analysis, structural equation modeling based on confirmatory factor analysis techniques, is a comprehensive statistical method that tests the theoretical model based on the relationships between variables (Schumacker & Lomax, 2004). Since the aim of the study was to test the hypothetical models proposed using path analysis, the predictive research model was chosen as the research model.

### *Population and Sample*

The target population of the study consists of students aged 14-17 enrolled in various upper-secondary vocational schools in a province in western Türkiye during the 2023-2024 academic year. For 4117 upper-secondary students in the central district of this province, the minimum sample size was determined to be 384 with a 95% confidence level and a 5% margin of error (Çıngı, 1990). Considering the possibility of data loss, 706 upper-secondary students were reached using the disproportionate cluster sampling method from this population. During the data preparation process, 252 data points were excluded from analysis. As a result of these studies, 454 upper-secondary vocational students formed the sample for the study.

The sample consists of 52.90% female and 47.10% male students. Fifty-six percent of the students are in tenth grade, while forty-three percent are in eleventh grade. 31.30% of the students have a GPA of 59 and below, 31.70% have a GPA between 60 and 69, and 37% have a GPA of 70 and above. Seventeen percent of students have full-time work experience, 27.80% have part-time work experience, and 55.30% have no work experience. It has been determined that 82.20% of students want to start their own business, and 49.30% have a business idea of their own.

### *Data Collection Process*

In collecting research data, the “Individual Entrepreneurship Orientation Scale” developed by Bolton and Lane (2012) and adapted into Turkish by Ercan and Yıldiran (2021), the “Analytical Thinking Scale” developed by Ocak and Park (2020) and the “Cultural Awareness Scale” developed by Koşar (2022) were used.

The Individual Entrepreneurship Orientation Scale is a 10-item, 5-point Likert-type measurement tool consisting of the dimensions of risk-taking, innovativeness, and proactivity. In terms of reliability, the total scores for the scale were calculated using Cronbach’s alpha reliability coefficient, which yielded a value of  $\alpha = .71$ . The reliability coefficients for the sub-factors ranged from .54 to .62. The scale was developed for use with higher education students. Still, it has been stated that it can also be used for upper-secondary students. In this context, the conceptual appropriateness of the scale items for the secondary education level was first evaluated based on expert opinion. Three experts participated in this study: one specializing in measurement and evaluation in education, and two specializing in curriculum and instruction. Based on expert opinions, it was determined that the scale items were conceptually appropriate

for secondary school students; however, it was decided to conduct confirmatory factor analysis. In the next stage, a confirmatory factor analysis study was conducted on the scale due to changes in the research sample group. Some of the fit indices obtained from the first-order multiple confirmatory factor analysis results ( $\chi^2(32, N = 454) = 123.34, p < .01$ ;  $\chi^2/df = 3.85$ ; RMSEA = .08; RMR = .09; SRMR = .07; GFI = .95; AGFI = .91; CFI = .86; NFI = .82) produced low values. Therefore, the standardized regression coefficients of the items were examined, and it was determined that the regression coefficient of the fourth item (.219) was low. The relevant item (Whether risky or not, I generally enjoy trying new and unusual activities that are not standard) is theoretically defined in the 'Innovation' dimension, but due to the term 'risk' contained within the item, it was thought that participants might associate it with the 'Risk Taking' dimension. This situation has shown that the item causes conceptual confusion (cross-loading) between the two dimensions in the measurement model and weakens its discriminant validity. In the confirmatory factor analysis process, it is recommended that items that do not fully correspond to the theoretical structure, exhibit low factor loadings, or disrupt the differentiation between dimensions be removed from the model (Brown & Moore, 2012). In this context, the analysis was repeated after removing the relevant item in order to preserve the structural integrity of the scale. A significant change in the model's fit values was observed with the removal of the item. The model fit indices were found to be  $\chi^2(24, N = 454) = 58.715, p < .01$ ;  $\chi^2/df = 2.34$ ; RMSEA = .06; RMR = .06; SRMR = .05; GFI = .97; AGFI = .95; CFI = .94; NFI = .91.

The standardized regression coefficients for the measurement model indicators range from .37 to .71, while the explanatory variances range from .14 to .51. The *t*-values for the items range from 5.81 to 8.10 and show significant relationships at the .01 level. The analysis confirmed the three-factor structure consisting of nine indicators of the individual entrepreneurship orientation scale. In terms of reliability, the Cronbach's alpha reliability coefficient for the scale's total scores was calculated as  $\alpha = .71$ . In this context, the theoretical structure of the relationship between the variables was taken into account, and the validity and reliability values were considered. The individual entrepreneurship orientation variable was included in the structural equation modeling under a single factor.

The analytical thinking scale is a 24-item 5-point Likert-type measurement tool consisting of four sub-dimensions: assimilation, attention to details, analysis, and working strategies. The Cronbach's alpha reliability coefficient for the total scale scores was calculated as  $\alpha = .92$ . The reliability coefficients for the subfactors range from .74 to .89. Confirmatory factor analysis was conducted by Ocak and Park (2020), and the fit indices were found to be  $\chi^2(249, N = 297) = 635.14$ ;  $\chi^2/df = 2.29$ ; RMSEA = .06; GFI = .86; CFI = .96; NFI = .93. Based on these studies, it has been determined that the model has been confirmed and that the scale is a valid measurement tool that can be used to determine the analytical thinking levels of upper-secondary students. As part of the reliability studies, Cronbach's alpha reliability coefficients were calculated, yielding  $\alpha = .76$  for the attention to detail subscale and  $\alpha = .74$  for the analysis subscale. In this context, considering the theoretical and statistical structure of the relationship between the variables, the variables of attention to detail and analysis were included in the structural equation modeling, along with the analytical thinking scale.

The Cultural Awareness Scale is a 19-item, five-point Likert-type measurement tool consisting of cognition, motivation, and sensitivity dimensions. As part of the reliability studies, the Cronbach's alpha reliability coefficient ( $\alpha = .86$ ) was calculated for the total scores on the scale. The reliability coefficients for the subfactors range from .63 to .82. Koşar (2022) conducted confirmatory factor analysis on the scale and obtained the following goodness-of-fit indices:  $\chi^2(774, N = 531) = 2014.17$ ;  $\chi^2/df = 2.86$ ; RMSEA = .05; SRMR = .06; GFI = .92; CFI = .93; NFI = .90. Although the target group of the scale is aged between 12 and 19, exploratory and confirmatory factor analysis studies related to the scale were conducted on seventh-grade

students. Due to changes in the sample group, the confirmatory factor analysis study for the scale was repeated. The first-order multiple confirmatory factor analysis results for the scale produced low values for some of the fit indices ( $\chi^2(149, N = 454) = 388.562, p < .01$ ;  $\chi^2/df = 2.61$ ; RMSEA = .06; RMR = .10; SRMR = .06; GFI = .92; AGFI = .89; CFI = .91; NFI = .87). As a result of the examinations, it was determined that the regression coefficient (.03) related to the fifth item was very low. The relevant item was removed, and the analysis was repeated. With the removal of the item, a significant change was observed in the model's fit values. The model fit indices were calculated as follows:  $\chi^2(132, N = 454) = 289.10, p < .01$ ;  $\chi^2/df = 2.19$ ; RMSEA = .05; RMR = .07; SRMR = .05; GFI = .93; AGFI = .91; CFI = .94; NFI = .90. The standardized regression coefficients for the measurement model indicators range from .16 to .84, while the explained variances range from .03 to .66. The t-values for the items range from 3.16 to 16.75 and show significant relationships at the .01 level. The results of the analysis indicate that the three-factor structure, consisting of 18 indicators from the cultural awareness scale, has been confirmed. As part of the reliability studies, the reliability coefficient  $\alpha = .64$  was calculated for the motivation subscale. In this context, considering the theoretical and statistical structure of the relationship between the variables, the motivation dimension of the cultural awareness scale was included in the structural equation modeling as a cultural motivation variable.

The research data was collected between February and May of the 2023-2024 academic year from five different upper-secondary vocational schools. During this process, data were collected from students who were present in classrooms on specified days and times and who volunteered to participate in the research. During the data collection process, the purpose of the study and the characteristics of the data collection tools were explained to the students, and an average of 40 minutes was allowed for the implementation.

### *Data Analysis*

Measurement models for the variables underlying the research were tested using confirmatory factor analysis. Path analysis was used to test hypothetical models, revealing the relationships between variables. During the data preparation process, missing values and outliers were identified, and the accuracy of the data, as well as the univariate and multivariate normality properties of the dataset, were assessed. As a result of these studies, a total of 252 data points were excluded, including three missing values, 189 univariate outliers, and 60 multivariate outliers.

The univariate normal distribution of the data was tested using skewness and kurtosis coefficients. As a result of this study, it was determined that the skewness and kurtosis coefficients for all items included in the scales subjected to confirmatory factor analysis and for the scale total scores varied within the  $\pm 1$  range and that the data demonstrated a univariate normal distribution (Tabachnick & Fidell, 2001).

Before developing the structural equation model, the multivariate normality and linearity characteristics of the data were tested using scatter plots. The elliptical graphs produced by the scatter plots showed that the multivariate normality and linearity conditions were met (Çokluk et al., 2012). Additionally, correlation values between variables were examined to test the multiple linear relationship. As a result of this study, it was determined that there were moderate or low levels of significant relationships between variables related to scale sub-dimensions that could indicate independent variable characteristics with individual entrepreneurship orientation ( $r < .80$ ;  $p < .01$ ). The variables with the highest correlation with individual entrepreneurial orientation were found to be the motivation variable ( $r = .34$ ) in the cultural awareness scale and the attention to detail ( $r = .24$ ) and analysis ( $r = .25$ ) variables in the analytical thinking scale. The multicollinearity statistics between independent variables were examined using VIF and tolerance values. As a result of this study, it was determined that VIF values ranged

between 1.37 and 2.44, while tolerance values ranged between .41 and .73. VIF values below 10 and tolerance values above .10 indicate that there is no multicollinearity problem among the independent variables (Mertler & Vannatta, 2005).

The AMOS 24 software package was used to analyze the data. The covariance matrix and maximum likelihood method were employed to test the measurement models and structural models, with a significance level of .05 used for statistical analyses. When testing whether the measurement models and structural models were confirmed, goodness-of-fit indices, including the chi-square test, RMSEA, RMR, SRMR, GFI, AGFI, CFI, and NFI, were used. The Sobel (1982) test and Bootstrap analysis were used together to evaluate the indirect effects of cultural motivation on entrepreneurial orientation through attention to detail and analysis skills. Suhr's (2008) classification served as the basis for interpreting the size of direct and indirect effects in structural equation modeling.

## Research Results

### *Measurement Models*

#### *Measurement Model of the Individual Entrepreneurship Orientation Scale*

Some of the fit indices obtained from the initial analysis results of the model test ( $\chi^2(27, N = 454) = 163.75, p < .01; \chi^2/df = 6.07; RMSEA = .11; RMR = .10; AGFI = .87$ ) produced low values. In this context, modification suggestions were examined, and it was determined that adding the error covariance between item 1 and item 3 would result in a 71% decrease in the Chi-Square value. As a result of the modification, an improvement in the fit values was observed ( $\chi^2(26, N = 454) = 85.91, p < .01; \chi^2/df = 3.30; RMSEA = .07; RMR = .07; AGFI = .93; NFI = .86$ ). However, since the RMSEA, RMR, and NFI values did not meet the criteria required for good fit, the modification suggestions were reviewed again. Since items 8 and 9 were considered related due to their similarity in content, modifications were made to the items, and the model was retested.

The addition of error covariance to the model resulted in a significant change in the model's fit values. The model fit indices were found to be  $\chi^2(25, N = 454) = 59.97, p < .01; \chi^2/df = 2.40; RMSEA = .06; RMR = .06; GFI = .97; AGFI = .95; CFI = .94; NFI = .90$ . The calculated fit indices indicate that the measurement model fits well. As a result of confirmatory factor analysis, it was determined that the standardized regression coefficients for the indicators ranged from .28 to .64. At the same time, the explanatory variances ranged from .08 to .41. It was also determined that the t-values for the items ranged from 3.97 to 5.30, indicating significant relationships at the .01 level. For the "individual entrepreneurial orientation" measurement model, the average variance extracted (AVE) was .21 and the composite reliability (CR) was .70. Following the modifications made during the confirmatory factor analysis process, it was confirmed that the single-factor structure, consisting of nine indicators of the individual entrepreneurship orientation variable, was supported.

#### *Measurement Model of the Cultural Motivation Scale*

The fit indices obtained from the first analysis result of the model test were found to be ( $\chi^2(14, N = 454) = 42.92, p < .01; \chi^2/df = 3.07; RMSEA = .06; RMR = .05; GFI = .97; AGFI = .95; CFI = .96; NFI = .95$ ). The values indicate that the measurement model fits good. The confirmatory factor analysis revealed that the standardized regression coefficients for the indicators ranged from .43 to .74. In contrast, the explanatory variances ranged from .19 to .55. The t-values for the items ranged from 8.28 to 13.06 and showed significant relationships at

the .01 level. For the “cultural motivation” measurement model, the average variance extracted (AVE) was .38 and the composite reliability (CR) was .81. As a result of confirmatory factor analysis, it was found that the single-factor structure consisting of seven indicators of the cultural motivation variable was confirmed.

#### *Measurement Model of the Attention to Detail Scale*

The fit indices obtained from the first analysis result of the model test ( $\chi^2(9, N = 454) = 20.10, p < .05; \chi^2/SD = 2.23; RMSEA = .05; RMR = .05; GFI = .98; AGFI = .96; CFI = .98; NFI = .96$ ) indicate that the measurement model demonstrates perfect fit. The confirmatory factor analysis revealed that the standardized regression coefficients for the indicators ranged from .52 to .68. In contrast, the explained variances ranged from .27 to .47. It was found that the t-values for the items ranged from 8.03 to 9.04 and showed significant relationships at the .01 level. For the “attention to detail” measurement model, the average variance extracted (AVE) was .35 and the composite reliability (CR) was .76. As a result of confirmatory factor analysis, it was found that the single-factor structure consisting of six indicators related to the variable of attention to detail was confirmed.

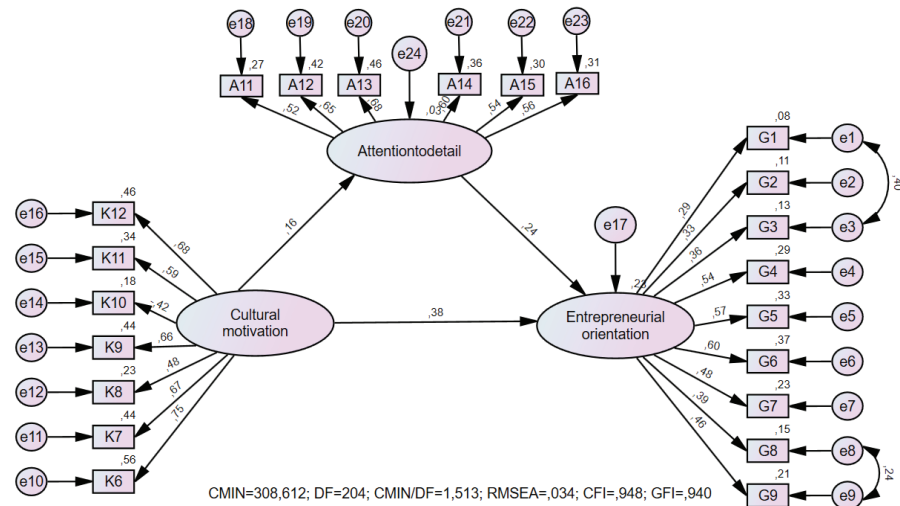
#### *Measurement Model of the Analysis Scale*

The fit indices obtained from the first analysis result of the model test ( $\chi^2(2, N = 454) = .75, p < .01; \chi^2/df = .38; RMSEA = .00; RMR = .01; GFI = .99; AGFI = .99; CFI = 1.00; NFI = .99$ ) indicate that the measurement model demonstrates perfect fit. The confirmatory factor analysis revealed that the standardized regression coefficients for the indicators ranged from .58 to .72. In contrast, the explanatory variances ranged from .34 to .52. The t-values for the items ranged from 9.09 to 9.68 and showed significant correlations at the .01 level. For the “analysis” measurement model, the average variance extracted (AVE) was .43 and the composite reliability (CR) was .75. As a result of confirmatory factor analysis, it was found that the single-factor structure consisting of four indicators related to the variable of analysis was confirmed.

#### *Testing Hypothetical Models*

The study identified two different models in which attention to detail and analysis variables mediate the effect of cultural motivation on entrepreneurial orientation. Based on the goodness of fit values obtained from the path analysis for the first model, it was determined that the model was acceptable and showed good fit ( $\chi^2(204, N = 454) = 308.61, p < .01; \chi^2/df = 1.51; RMSEA = .03; SRMR = .05; GFI = .94; AGFI = .93; CFI = .95; NFI = .86$ ). These results showed that the model has been confirmed. The results of the path analysis for the proposed model are presented in Figure 3.

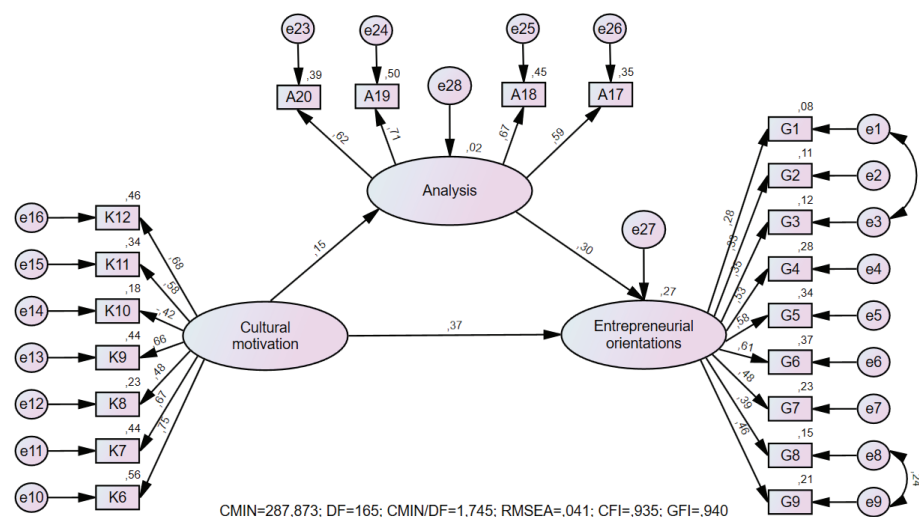
**Figure 3**  
*First Structural Equation Model Explaining Entrepreneurial Orientation*



In the model presented in Figure 3, it was determined that the path coefficients between the cultural motivation and attention to detail latent variables, as well as the attention to detail and entrepreneurial orientation variable, were significant at the .01 level. The path coefficient between the cultural motivation and entrepreneurial orientation variables was found to be significant at the .001 level. According to the analysis results, the standardized path coefficient between cultural motivation and attention to detail variables was .16, while the path coefficient between attention to detail and entrepreneurial orientation variables was .24.

Based on the goodness of fit values obtained from the path analysis for the second model, it was determined that the model is acceptable and shows good fit ( $\chi^2(165, N = 454) = 287.87, p < .01$ ;  $\chi^2/df = 1.75$ ; RMSEA = .04; SRMR = .05; GFI = .94; AGFI = .92; CFI = .94; NFI = .86). These results indicated that the model was confirmed. The path analysis results for the second model are presented in Figure 4.

**Figure 4**  
*The Second Structural Equation Model Explaining Entrepreneurial Orientation*



In the model presented in Figure 4, it was determined that the path coefficients between the latent variables of cultural motivation and analysis and the entrepreneurial orientation variable were significant at the .001 level. The path coefficient between the cultural motivation and analysis variables was found to be significant at the .05 level. According to the analysis results, the standardized path coefficient between cultural motivation and the analysis variables was found to be .15. In contrast, the path coefficient between the analysis and entrepreneurial orientation variables was found to be .30.

### *Direct and Indirect Effects*

In this study, the mediating role of attention to detail and analysis skills in the effect of cultural motivation on entrepreneurial orientation was examined. In this context, the direct effect of cultural motivation on entrepreneurial orientation was tested first. According to the analysis results, the total effect of cultural motivation on entrepreneurial orientation was found to be statistically significant ( $\beta_1 = .16$ ;  $p < .001$ ). The standardized path coefficient between the two variables ( $\beta_0 = .42$ ) indicates that the effect of cultural motivation on entrepreneurial orientation is moderate (Suhr, 2008). In this context, it was determined that as cultural motivation increases, entrepreneurial orientation also increases; cultural motivation explains 18% of the variance in entrepreneurial orientation ( $R^2 = .18$ ).

As a result of the Sobel (1982) test used to test indirect effects, it was determined that the indirect effect in the model mediated by the variable of attention to detail was statistically significant ( $Z = 2.50$ ;  $p < .05$ ). During the bootstrap analysis process, the steps recommended in the literature (Burmaoğlu, Polat & Meydan, 2013) were followed, and after the model was developed, 1000 bootstrap samples were generated, and the confidence level was set to 95%. The bootstrap analysis results showed that the indirect effect in the model mediated by the attention to detail variable was significant ( $\beta_0 = .04$ ;  $p < .01$ ). The bias-corrected confidence interval (B-CIs) values for cultural motivation range between .01-.08. The Sobel (1982) test for the mediating effect of analysis skills showed that the calculated indirect effect was statistically significant ( $Z = 2.02$ ;  $p < .05$ ). The results of the bootstrap analysis also showed that the indirect effect was significant ( $\beta_0 = .05$ ;  $p < .05$ ). The results for the direct and indirect effects in the model mediated by the attention to detail variable are summarized in Table 1.

**Table 1**

*The Mediating Role of Attention to Detail in the Effect of Cultural Motivation on Individual Entrepreneurial Orientation*

| Variables                | Attention to Detail |           |     | Entrepreneurial Orientation |           |     |
|--------------------------|---------------------|-----------|-----|-----------------------------|-----------|-----|
|                          | $\lambda(\beta_0)$  | $\beta_1$ | SE  | $\lambda(\beta_0)$          | $\beta_1$ | SE  |
| Cultural Motivation (c)  |                     |           |     | .42                         | .16***    | .04 |
|                          |                     |           |     |                             |           | .18 |
| Cultural Motivation (a)  | .16                 | .13**     | .05 |                             |           |     |
|                          | .03                 |           |     |                             |           |     |
| Cultural Motivation (c') |                     |           |     | .38                         | .15***    | .04 |
| Attention to Detail (b)  |                     |           |     | .24                         | .12**     | .04 |
|                          |                     |           |     |                             |           | .23 |
| Indirect effect          |                     |           |     |                             | .04**     |     |

\*\*\* $p < .001$ ; \*\* $p < .01$ ; \* $p < .05$

As shown in Table 1, a positive and significant relationship was found between cultural motivation and attention to detail ( $\beta_1 = .13, p < .01$ ). The standardized path coefficient between the two variables ( $\beta_0 = .16$ ) indicates that the effect of cultural motivation on attention to detail is at a low level (Suhr, 2008). The effect of attention to detail, as a mediating variable, on entrepreneurial orientation is also statistically significant ( $\beta_1 = .12; p < .01$ ). Accordingly, it was determined that as the skill of attention to detail increases, entrepreneurial orientation also increases. The standardized path coefficient between the two variables ( $\beta_0 = .24$ ) indicates that the effect of attention to detail on entrepreneurial orientation is moderate (Suhr, 2008).

The indirect effect of cultural motivation on entrepreneurial orientation was also statistically significant ( $\beta_0 = .04; p < .01$ ); as cultural motivation and attention to detail increased, entrepreneurial orientation also increased. It has been determined that cultural motivation, combined with attention to detail, accounts for 23% of the variance in entrepreneurial orientation ( $R^2 = .23$ ). The standardized path coefficient between the variables indicates that the indirect effect is at a low level (Suhr, 2008). It was determined that the relationship between cultural motivation and entrepreneurial orientation remained statistically significant when the attention to detail variable was included in the model as a mediator variable. Still, there was a slight decrease in the standardized path coefficient ( $\beta_0 = .38, p < .01$ ). According to Baron and Kenny (1986), when a mediator variable is included in the analysis, the relationship between the dependent and independent variables is expected to become insignificant or the mediator variable is expected to reduce the relationship. This situation showed that attention to detail was a partial mediator variable in the effect of cultural motivation on entrepreneurial orientation. The results of the direct and indirect effects in the model, where analysis skill is the mediator variable, are summarized in Table 2.

**Table 2**

*The Mediating Role of Analysis in the Effect of Cultural Motivation on Individual Entrepreneurial Orientation*

| Variables                | Analysis           |           |     | Entrepreneurial Orientation |           |     |
|--------------------------|--------------------|-----------|-----|-----------------------------|-----------|-----|
|                          | $\lambda(\beta_0)$ | $\beta_1$ | SE  | $\lambda(\beta_0)$          | $\beta_1$ | SE  |
| Cultural Motivation (c)  |                    |           |     | .42                         | .16***    | .04 |
|                          |                    |           |     |                             | .18       |     |
| Cultural Motivation (a)  | .15                | .13*      | .05 |                             |           |     |
|                          | .02                |           |     |                             |           |     |
| Cultural Motivation (c') |                    |           |     | .37                         | .14***    | .04 |
| Analysis (b)             |                    |           |     | .30                         | .13***    | .04 |
|                          |                    |           |     |                             | .27       |     |
| Indirect effect          |                    |           |     |                             | .05*      |     |

\*\*\* $p < .001$ ; \*\* $p < .01$ ; \* $p < .05$

As shown in Table 2, a positive and significant relationship was found between cultural motivation and analysis variables ( $\beta_1 = .13, p < .05$ ). The standardized path coefficient between the two variables ( $\beta_0 = .15$ ) shows that the effect of cultural motivation on analysis is at a low level (Suhr, 2008). The effect of analysis, which is the mediating variable, on entrepreneurial orientation is also statistically significant ( $\beta_1 = .13; p < .01$ ). Accordingly, as the analysis skill increases, entrepreneurial orientation also increases. The standardized path coefficient ( $\beta_0 = .30$ ) between the two variables indicates that the effect of analysis skill on entrepreneurial orientation is moderated (Suhr, 2008).

The indirect effect of cultural motivation on entrepreneurial orientation is also statistically significant ( $\beta_0 = .05$ ;  $p < .05$ ); as cultural motivation and analysis skill increase, entrepreneurial orientation also increases. It was determined that cultural motivation, combined with the skill of analysis, explains 27% of the variance in entrepreneurial orientation ( $R^2 = .27$ ). The standardized path coefficient between the variables indicates that the indirect effect is at a low level (Suhr, 2008). With the inclusion of the analysis variable as a mediating variable in the model, it was determined that the relationship between cultural motivation and entrepreneurial orientation remained statistically significant. Still, there was a slight decrease in the standardized path coefficient ( $\beta_0 = .37$ ,  $p < .01$ ). This indicates that the analysis is a partial mediating variable in the effect of cultural motivation on entrepreneurial orientation.

## Discussion

The results of the measurement models obtained from the research indicate that the unidimensional measurement models consisting of nine indicators for individual entrepreneurship orientation, seven indicators for the cultural motivation model, six indicators for the attention to detail model, and four indicators for the analysis model have been validated. The fit indices for the models indicate that the individual entrepreneurship orientation and cultural motivation models showed good fit, while the attention to detail and analysis models showed perfect fit (Byrne, 2010; Hooper et al., 2008; Hu & Bentler, 1999; Kline, 2005; Schumacker & Lomax, 2004; Tabachnick & Fidell, 2001). However, it was observed that the average explained variance (AVE) values for the measurement models remained below the .50 threshold. The composite reliability (CR) values for the measurement models were determined to be in the range of .70 to .81. The literature indicates that AVE is a fundamental criterion in assessing convergent validity; however, it is noted that CR values above .70, particularly in unidimensional structures, provide significant evidence of the structure's internal consistency (Hair et al., 2006). In this context, despite acceptable levels of composite reliability values and meaningful factor loadings, the observed low AVE values indicate that convergent validity is only achieved to a limited extent in the measurement models. This situation has been considered an important methodological limitation that should be considered when interpreting the results obtained from the study.

This study also aimed to examine the predictive relationships among upper-secondary vocational students' entrepreneurial orientations, cultural motivation, attention to detail, and analysis skills using structural equation modeling. According to the study's results, it was determined that the effect of cultural motivation on entrepreneurial orientation is statistically significant. The standardized path coefficient between the two variables shows that cultural motivation is a variable that moderately predicts entrepreneurial orientation. In this context, as cultural motivation increases, entrepreneurial orientation also increases, with 18% of the variance in entrepreneurial orientation being explained by cultural motivation.

It is stated that culture, defined as a value system specific to a particular society, forms the identity of a society or group and affects many aspects of human life, including moral rules, behavior patterns, and lifestyle. Therefore, it is stated that culture is effective in the development of individuals' behavior and personality traits (Hofstede, 2001; Schwartz, 2006). Culture influences entrepreneurial behavior by either supporting or hindering values such as risk-taking, independent thinking, and courage (Miller & Le Breton-Miller, 2017). Studies in the relevant literature have also determined that there is a significant relationship between the variables that constitute cultural structure and entrepreneurial characteristics, and that cultural variables have a positive effect on entrepreneurial characteristics (Alpay & Çatı, 2021; Brettel et al., 2015; Kusumojanto et al., 2021; Munyanyi et al., 2018; Pinillos & Reyes, 2011; Ufacık, 2018). These studies demonstrate that entrepreneurial characteristics, which are directly related to the structure of society, are influenced by cultural factors and support the obtained results.

In addition, the impact of cultural motivation on entrepreneurship should be evaluated in relation to individualistic and collectivist cultural structures and countries' levels of economic development. This motivation is stated to have a positive effect on entrepreneurial activities (Mueller & Thomas, 2001; Shane, 1993). However, in low- and middle-income countries, a negative relationship has been found between individualism and the rate of entrepreneurship. In contrast, in high-income countries, individualism appears to be a positive factor that triggers innovation and technological entrepreneurship (Pinillos & Reyes, 2011). In this context, it is stated that countries' levels of development may interact with different cultural factors that determine the level of entrepreneurial activity (Wennekers et al., 2005). Therefore, the results obtained from this study should be evaluated in a way that is limited by the level of development of the country from which the sample was taken and the dominant cultural structure.

According to other study results, cultural motivation significantly predicts analytical thinking skills, including attention to detail and analysis. However, it has a low effect on these variables. The low effect of cultural motivation on analytical thinking skills can be explained by the cognitive and affective characteristics of the variables. Characteristics such as motivation, attitude, and values are included in the scope of affective skills, which reflect individuals' affective awareness of an event or situation through their behavior (Posner & Rudnitsky, 2006). Analytical thinking skills, on the other hand, encompass cognitive characteristics that require analyzing problems, making decisions about solutions, and evaluating processes (Nuroso et al., 2018; Sternberg, 2007). However, an individual's thinking skills are significantly influenced by the culture in which they live (Hofstede, 2001). In the literature, there are no studies that directly examine the relationship between cultural characteristics and analytical thinking skills. However, studies examining the relationship between cultural characteristics and higher-order thinking skills have been identified in the literature. The results of these studies indicate that culture plays a significant role in the development of critical thinking and the differentiation of thinking styles (Cheng et al., 2011; Lu et al., 2021; Lun, 2010). In the study by Manalo et al. (2015), it was found that a relationship exists between cultural dimensions and critical thinking levels; however, culture does not have a direct effect on critical thinking levels. When evaluated within the specific scope of the research results, the fact that upper-secondary vocational curricula are predominantly oriented toward practical and technical skills may have led students to direct their motivational energies toward tangible outputs rather than abstract and comprehensive analytical processes. In alignment with the literature, Ang and Van Dyne (2008) argued that interest in cultural processes (motivation) is not sufficient on its own to utilize the cognitive tools necessary for analyzing complex data. Consequently, the low-level effect of cultural motivation on analytical thinking skills in the vocational school sample may stem from the fact that while motivation provides a vision for 'what to do' in the entrepreneurship process, it does not inherently build a technical analytical capacity for 'how to execute' it. This situation highlights the necessity of integrating not only cultural awareness and motivation-enhancing activities but also strategic thinking and analytical analysis modules into the curricula of entrepreneurship education in vocational schools. Furthermore, although the reliability coefficient for the cultural motivation scale ( $\alpha = .64$ ) exceeds the acceptable lower limit of .60 suggested for exploratory research (Hair et al., 2006; Peterson, 1994), it remains below the widely recognized threshold of .70. This situation may have led to an attenuation effect in the observed relationships due to an increased margin of measurement error. In other words, the impact of cultural motivation on the attention to details and analysis skills may have been underestimated compared to the actual strength of the relationship. Therefore, this limitation should be taken into careful consideration when interpreting the relationships between the variables in question.

Other results obtained in the study are related to the effect of attention to detail and analysis skills on entrepreneurial orientation. According to the research results, attention to detail and analysis, which are part of analytical thinking skills, are variables that predict entrepreneurial

orientation at a moderate level. Therefore, it is seen that entrepreneurial orientation increases with the improvement of attention to detail and analysis skills. In the literature, no study has been found that examines the relationship between analytical thinking skills and entrepreneurial orientation. However, analytical thinking skills form the basis for the development of different higher-order thinking skills (Anderson et al., 2018; Facione, 1990; Halpern, 2001). For example, analytical thinking, considered a fundamental component of critical thinking, is also employed in the problem-solving process (Markman et al., 2007; Ocağ & Akkaş-Baysal, 2021; Robbins, 2011; Weisberg, 2015). The results of relevant studies indicate significant relationships between variables related to the critical thinking process and entrepreneurial characteristics (Gönül, 2023; Gözübüyük, 2019; Öztürk, 2020). Studies examining the relationship between creative and innovative thinking skills and entrepreneurial characteristics have also found significant positive relationships between the variables (Gözübüyük, 2019; Kılıçoğlu & Yıldırım, 2023). In this context, the result that attention to detail and analysis skills are variables that predict entrepreneurial orientation at a moderate level is supported by theoretical explanations in the literature on thinking and relevant research results.

According to other results obtained in the study, attention to detail and analysis skills partially mediate the relationship between cultural motivation and entrepreneurial orientation variables. Accordingly, as cultural motivation increases, attention to detail and analysis skills also increase, and the relationship established between these variables also increases entrepreneurial orientation. In other words, cultural motivation enhances entrepreneurial orientation by fostering attention to detail and analysis skills. It was determined that indirect effects in models containing variables related to attention to detail and analysis were low. The low level of indirect effects indicates that the mediating roles of attention to detail and analysis skills are not strong, and that the direct relationship between cultural motivation and entrepreneurial orientation is more dominant.

These results regarding indirect effects can be explained by the fact that cultural motivation is a variable that produces both social and individual impact. Individuals' attitudes and behaviors are shaped by social norms (Çarıkçı & Koyuncu, 2010; Eryılmaz, 2019; Hofstede, 2001). Individuals with strong cultural motivation are expected to be more willing to produce ideas or products that reflect their cultural background in their work (Koşar, 2022). In this context, the fact that individuals with high cultural motivation are more willing to recognize and evaluate entrepreneurial opportunities that are appropriate to their cultural context may have led to a more pronounced direct effect on entrepreneurial orientation. Although attention to detail and analysis are skills that directly affect entrepreneurial opportunities, they are more related to the specific approach to the job than to the general orientation toward entrepreneurial opportunities (Baron & Shane, 2005). In this context, cultural motivation, where interaction with the environment is considered within a more comprehensive framework, can be regarded as a factor that strengthens the direct impact of this variable on entrepreneurial orientation.

When comparing the models tested in the study, it was found that the skill of analysis led to a more significant decrease in the effect of cultural motivation on entrepreneurial orientation than the skill of attention to detail. Cultural motivation explains 18% of the variance in entrepreneurial orientation, while the variance explained by including attention to detail in the model rises to 23%. In the model that involves analysis skill, the explained variance has increased to 27%. These results show that the mediating effect of analysis skill is higher than that of attention to detail.

The analytical thinking process consists of the following stages: identifying and classifying the parts that constitute the problem or situation, establishing the relationship between the parts and the whole, evaluating the validity and reliability of the reasons on which the views are based, and reaching a conclusion (Akkuş-Çakır & Senemoğlu, 2016; Dilekli, 2019). The analysis required in this process involves breaking down the problem into parts

and establishing the relationship between these parts and the whole (Anderson et al., 2018). Therefore, individuals with high-level analysis skills are expected to analyze different solutions, compare alternatives, and make strategic decisions aimed at achieving results. When examined in terms of entrepreneurial orientation, the skill of analysis contributes to individuals' ability to identify entrepreneurial opportunities and evaluate them strategically in terms of factors such as cultural entrepreneurial dynamics and customer needs. In this context, the skill of analysis may have taken on a stronger mediating role, contributing to the strategic analysis of entrepreneurial opportunities that are appropriate to specific cultural contexts. The skill of attention to detail requires careful examination of a topic or problem, focusing on details rather than general aspects, and paying more attention to steps and details rather than overall effects (Ocak & Park, 2020). The lower-level mediating role of attention to detail may be due to this skill focusing on the technical and procedural aspects of a topic or problem and requiring implementation in a more limited context.

## Conclusions and Implications

It was determined that cultural motivation is a variable that positively predicts entrepreneurial orientation at a moderate level. The effect of cultural motivation on attention to detail and analysis skills is at a low level. Attention to detail and analysis skills are variables that positively and moderately predict entrepreneurial orientation. In terms of the effect of cultural motivation on entrepreneurial orientation, it was found that attention to detail and analysis skills are partial mediating variables, with the indirect effects being relatively low.

The results obtained offer significant implications for both the local cultural context and the international vocational education literature. Considering Turkey's high-context cultural structure and the traditional master-apprentice relationship in vocational education, it is suggested that students' cultural motivation may generally be regarded as a form of social openness; however, due to the practice-oriented nature of technical education, this motivation does not spontaneously transform into analytical processes such as complex risk analysis. These results demonstrate for developing economies—where technical education is predominant on a global scale—that the link between cultural motivation and analytical performance can only be established through metacognitive strategies. In this context, it is considered crucial to integrate not only cultural awareness into vocational education curricula but also elective courses and social responsibility projects such as cross-cultural problem-solving, case studies, and statistical data analysis that can process this motivation, in order to strengthen students' global entrepreneurial capacities that transcend local boundaries.

The results of this study are limited to examining the mediating effect of analytical thinking skills. Within this scope, the mediating role of different cognitive and affective variables in the effect of cultural motivation on entrepreneurship can be examined. Additionally, predictive studies can be conducted to investigate the relationship between cross-cultural entrepreneurship strategies and analytical thinking skills.

## Ethical Statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and national research committee, as well as with the 1964 Declaration of Helsinki and its subsequent amendments. Ethical approval was obtained from the Ethics Committee of Kütahya Dumlupınar University (Türkiye) under protocol number 369, dated 27.10.2023

## Note

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## Declaration of Interest

The authors declare no competing interests.

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