AMERICAN UNIVERSITY OF BEIRUT

AN EXTENSION OF THE ARAB PERSONALITY INVENTORY: THE RELATIONSHIP BETWEEN DOMINANT PERSONALITY PROFILES(S) AND UNIVERSITY FIELDS

by
FABIENNE TANIOS KARAM

A thesis
submitted in partial fulfillment of the requirements
for the degree of Master of Science
to the Department of Business Analytics
of the Faculty/School of Suliman S. Olayan School of Business
at the American University of Beirut

Beirut, Lebanon
February 2022

AMERICAN UNIVERSITY OF BEIRUT

AN EXTENSION OF THE ARAB PERSONALITY INVENTORY: THE RELATIONSHIP BETWEEN DOMINANT PERSONALITY PROFILES(S) AND UNIVERSITY FIELDS

by

FABIENNE TANIOS KARAM

Approved by:

Dr. Lina Daouk-Öyry, Associate Professor	Signature Lina Daouk-Öyry
Suliman S. Olayan School of Business	Advisor
Dr. Wissam Sammouri, Assistant Professor of Practice	Signature
Suliman S. Olayan School of Business	Co-Advisor
	Signature
	Member of Committee
	Signature
	Member of Committee

Date of thesis defense: February 2, 2022

AMERICAN UNIVERSITY OF BEIRUT

THESIS RELEASE FORM

Student Name:	Karam	Fabienne	Tanios
	Last	First	Middle

I authorize the American University of Beirut, to: (a) reproduce hard or electronic copies of my thesis; (b) include such copies in the archives and digital repositories of the University; and (c) make freely available such copies to third parties for research or educational purposes:

- ☐ As of the date of submission
- ☐ One year from the date of submission of my thesis.
- ☐ Two years from the date of submission of my thesis.
- ☒ Three years from the date of submission of my thesis.

Fabienne Karam — 02-07-2022

Signature — Date

ACKNOWLEDGEMENTS

I would like to express my gratitude and appreciation towards my family and close friends. They have been nothing less than my backbone throughout this journey. Their constant support and push kept me going through all the rollercoasters that taught me life-long lessons.

This accomplishment would not have been possible without them. Thank you for always believing in me even during the most difficult times. Thank you for believing in my capabilities, especially during times I was unable to do that for myself.

Last but not least, the biggest thank you goes to my professors, Dr. Lina Daouk-Öyry and Dr. Wissam Sammouri. I wouldn't have reached this stage without them. Thank you for all the meetings, phone-calls, and feedback. Thank you for all the efforts and thank you for your constant motivation. We made it.

ABSTRACT

OF THE THESIS OF

Fabienne Tanios Karam for Master of Science
Major: Business Analytics

Title: An Extension of the Arab Personality Inventory: The Relationship between Dominant Personality Profile(s) and University Fields

The general goal of the current study was to link the seven API personality factors to the educational field. Moreover, the research question that was looked into was what combination of API factor-score contributes to students feeling better fit in their educational fields.

This study is based on the API short, which summarizes personality into seven factors across the Arab Levant. The educational majors that make up those fields (Sciences and Social Sciences, Business, Arts, and Engineering and Architecture) are majors that students say they have the right personality for as well as majors they think they would have fit in had given the chance.

Based on the Association Rule Mining and Apriori algorithm, the top ten rules per field were identified and used to highlight the relationship between the factors and the field at hand. From which, further analysis and implications have been made based on the results.

TABLE OF CONTENTS

ILLUSTRATIONS

Figure

TABLES

Table

ABBREVIATIONS

API	Arab Personality Inventory
CES	Conventional, Enterprising, Social
ESA	Enterprising, Social, Artistic

CHAPTER 1

INTRODUCTION

Personality tests are standardized assessments used to determine a person's set of preferences, traits, or behavioral styles (Lundgren et al., 2019). Such assessments usually involve behavioral, observational, and self-report measures (Tekofsky et al., 2013).

One of the well-known personality models is the Big Five Factor model. It is through the work of Allport and Odbert that this model was developed (Favaretto et al., 2019). It is based on five general traits, which are Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism (OCEAN). These traits are the basic dimensions in which people differ, and their sub-components provide the qualities within each trait (Karataş, 2015). One of the advantages of using this model is that personality (as measured by the Big Five) is relatively stable over a four year period across different age groups (John et al., 2020). There are different instruments that measure this model such as the International Personality Item Pool (IPIP) and the NEO-PI (Zeinoun et al., 2017). These tools and their factor structure have been adapted to multiple languages and cultures (Zeinoun et al, 2017). Moreover, there are different studies that have come to identify personality factors in cultures that are in common with the Big 5 Model and other factors that are unique to that specific culture (Zeinoun et al., 2017). For example, the results of a study conducted in China showed that there are four personality factors that are related to the Big Five Model and another factor is an indigenous element (Interpersonal Relatedness) (Zeinoun et al., 2017). Another study conducted in South Africa showed similar results in that the South African model shared similarities with the Big Five Model (Zeinoun et al., 2017). However, it was also found that other factors, such

as Facilitating and Ubuntu, were not part of the previously stated model (Zeinoun et al., 2017).

There are many different types of personality tests and notably for this research; it is important to shed some light on the Arab Personality Inventory since it is the main building block of this research study. One of the first goals related to the API is the ability to identify personality dimensions across cultures (Zeinoun et al., 2017). Through the process of factor analysis, the resulting factors in the Arab culture consisted of Morality, Conscientiousness, Positive Emotionality, Dominance, Agreeableness/Righteousness, and Emotional Stability (Zeinoun et al., 2017). The initially stated factors have commonalities with well-known personality theories, which are usually applied to any culture, but they also deviate from them and are specific to the culture under study (Zeinoun et al., 2017). Thus, it can safely be said that the Arab-Levant personality is made up of etic and emic aspects respectively (Zeinoun et al., 2017). As stated by Zeinoun et al. (2017), the etic approach focuses on the implementation of an instrument like the IPIP to check if the constructs developed in one culture can be detected in a new one. The emic approach focuses on the development and the understanding of culture-specific perspectives of personality (Zeinoun et al., 2017). A final unpublished article titled *Development and Validation of a Short Version of the Arab Personality Inventory: The API short*, followed the previously stated articles. The goal was to compile the fewest number of items for the API that can cover the seven factors while demonstrating adequate validity and reliability in Arab countries (Zeinoun et al., 2020). The concurrent, convergent, and divergent validities were analyzed and ensured (Zeinoun et al., 2020). The result of this study, which is the basis for this current one, is a set of 52 items that measure the personality of the Arab culture based on seven factors (Zeinoun et al., 2020).

As noted in various studies, such as but not limited to Aljojo (2016) and Larson et al. (2010), the personality of an individual plays a significant role in many of the decisions that one makes throughout the course of their life such as work and educational related decisions. More specifically, different studies have come to show that different personalities tend to affect the choice of university majors. In other words, one of the many factors that play a role in this decision is one's personality. Moreover, personality tests are constantly being administered in workplaces and more importantly for the course of this research; in the educational field. This has been happening because when a student has to decide on what university major to pursue, it is definitely not an easy task. In other words, major-related decisions are among the toughest decisions for individuals (Humburg, 2012). Choosing a college major narrows down the kind of actions the individual will be doing for large parts of their lives; hence, one can assume that graduates do not make this decision easily (Humburg, 2012). On one side, students' satisfaction with their major choice leads to satisfaction with the academic field and with future occupation (Lakhal et al., 2012). On the other hand, dissatisfaction with the selected major can be a reason for failure and dropout from university (Lakhal et al., 2012).

With all that being said, the main goal of this research is to establish a link between the API and the educational setting. Such a link not only has multiple benefits, but it has not been previously implemented within the realm of the API, which makes it a novel form of research.

1.1. Research Objective and Methodology

The main goal of this research is to be able to identify which combination of the API factors and their ratings are playing an important role in having students feel

relatively content or fit in different educational fields. In order to achieve this purpose, we propose the following methodology presented in figure 1.

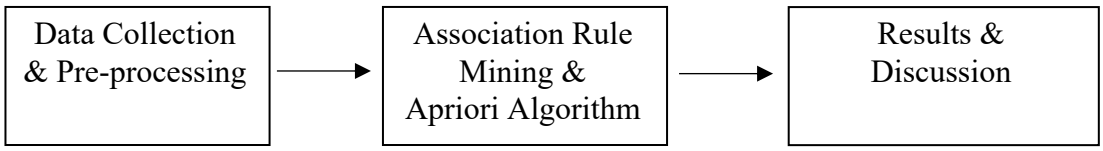

Figure 1. A summary of the methodology in this research.

This paper is organized as follows: Chapter 2 summarizes the previous literature that involves personality test implementation in various environments (workplace and educational settings). In addition, chapter 3 discusses the methods of this research, which is subdivided into various aspects which are the Participants, Procedure, Instrument, and Data Analysis. Also, chapter 4 presents all the results and chapter 5 looks into the discussions presented. Finally, the remaining chapters (6 and 7) look into the limitations and conclusion.

CHAPTER 2

LITERATURE REVIEW

A literature review has been conducted in order to look into what has been previously done in this research scope. In other words, this section highlights some of the research that has been done about the application of personality tests in different settings with a major focus on the educational field.

In the workplace, research has consistently shown that there are different factors that play an important role in one's career such as an individual's interests, skills, abilities, personality, and values (Kothari & Pingle, 2015). Moreover, there are different individuals that are a 'fit' for a particular career based on their knowledge, skill, and disposition (Aljojo, 2016). More specifically, different literature reviews have come to show that personality traits are related to workplace behaviors, attitudes, and performances (Yesil & Sozbilir, 2013). On a similar note, personality tests are used during the process of employee selection (Kramer et al., 2014). That is, when we find what personality type is appropriate for a job then this can be used to recruit and hire the right person (Virgana, 2020). For example, employees high in conscientiousness demonstrate superior job performance across a range of jobs (Kramer et al., 2014). Hence, these tests can aid the recruitment process and in turn inevitably affect the overall organizational performance (Virgana, 2020). In addition, it has been noticed that personality tests are generally used in management coaching, educational leadership, management learning, leadership development, and organizational and team development (Lundgren et al., 2019).

To add to that, one's personality and personality tests play a huge role in the educational sector in terms of academic major and performance. There is evidence to

suggest that certain personality traits may increase or decrease the likelihood of students pursuing a particular major (Larson et al., 2010). In other words, as communicated by John Holland, "…the choice of occupation and by extension, choice of educational major, is an expression of personality" (Larson et al., 2010). As highlighted by Vedel et al. (2015), many different studies found significant personality differences with some general trends on the Big Five Factor Model. For example, Economics majors scored low on agreeableness and neuroticism, while Psychology and Arts/Humanities students scored high (Vedel et al., 2015). Moreover, Science majors scored low on extraversion, while Economics students scored high (Vedel et al., 2015).

There are different studies that have tackled the subject of personality tests in the education field in various ways. Some studies direct their focus onto the business major. For example, as highlighted by Lakhal et al. (2012), a sample of 109 students enrolled in a compulsory undergraduate business course completed an online questionnaire that measured the Big Five Personality traits. The results showed that gender and personality (Neuroticism, Openness to Experience, Agreeableness, and Conscientiousness) account for 42.2% of the variance in students' choice of a thing-oriented or person-oriented business major (all while controlling for gender) (Lakhal et al., 2012). In other words, when a student is female and she scores low on emotional stability, high on openness to experience, more on agreeableness, and low on conscientiousness, she is more likely to select a person-oriented business major (Lakhal et al., 2012). When a student is a male and he scores high on emotional stability, low on openness to experience, low on agreeableness and high on conscientiousness, he is more likely to select a thing-oriented business major (Lakhal et al., 2012). Moreover, another study used a cross-sectional survey method to collect data from large-scale private universities (Shahzad et al., 2013).

The 254 respondents were classified into two groups: business students VS non-business students who were earning technical degrees (Shahzad et al., 2013). The questionnaire used in this study was developed by Goldberg, which measures the Big Five Personality traits (Shahzad et al., 2013). The results show a significant impact of the Big Five personality traits on students' selection of business or non-business degrees (Shahzad et al., 2013). More specifically, students from business majors scored high for extraversion and emotional stability, but they scored low on agreeableness, conscientiousness, and openness to experience (Shahzad et al., 2013).

Other studies have focused on various types of majors beyond the business one. Based on the workings of Naydenova et al. (2012), two student groups (psychology majors VS non-psychology majors) were examined to check if they differed on the Big Five model of personality and four narrow personality traits. This study was based on the data received from 120 undergraduate psychology majors and 1,916 non-psychology majors (Naydenova et al., 2012). These participants filled in the Resource Associates Transition to College (TTC) questionnaire (Naydenova el al., 2012). As hypothesized, psychology majors scored higher on openness to experience, higher on work drive, and lower on tough-mindedness than non-psychology majors did (Naydenova et al., 2012). Another example would be a study conducted by Aljojo (2016), in which the Arabic version of the Holland test was applied to 117 female students in King Abdulaziz University. The sample of students consisted of three majors: Computer Science, Information Systems, and the preparatory year distance-learning students (Aljojo, 2016). The results of this study show a difference between the previously stated three majors in regards to personality types and suitable careers (Aljojo, 2016). More specifically, Computer Science and Information System students had a frequent Holland code of CES

(Aljojo, 2016). On the other hand, the most frequent Holland code for preparatory year distance learning students was ESA (Aljojo, 2016). Another research conducted by Humburg (2012) examined how the probability of choosing a certain college major varies with personality traits captured by the Big Five Factor Model. The data was collected using the Five Factor Personality Inventory from students who were 12, 13, or 14 in 1999 and then focused on individuals who, from 2004 on, entered university education (Humburg, 2012). The results show that extraversion, conscientiousness, emotional stability and autonomy are significant for college major choice (Humburg, 2012). Moreover, results show that the effect sizes of personality are comparable to and sometimes larger than those of cognitive skills (Humburg, 2012).

Not only are there studies that look into the link between personality tests and university majors, but there is also a focus on the link between personality tests and academic performance. This is because the ability to predict academic performance has important implications for college admissions committees, students, and parents especially given the resources invested in college education (McCredie and Kurtz, 2019). There is a study by John et al. (2020) that investigates the impact of Big Five personality traits on academic performance as measured by the CGPA of undergraduate college students at Forman Christian College, Lahore (N = 406). The results show that openness to experience was most positively related to academic performance followed by agreeableness and conscientiousness (John et al., 2020). However, neuroticism and extraversion were found to have no significant correlation with academic performance (John et al., 2020). Moreover, another study with a similar goal was based on a sample of second and third year students in a Russian University using the Big Five Factor Model (Nye et al., 2016). The results from the Unified State Examination (for university

admissions) and their current grade point averages were used as measures of academic performance (Nye et al., 2016). The results show that introversion, agreeableness, neuroticism, and openness to experience have observable ties to academic performance (Nye et al., 2016).

In this study, we explore the relationship between personality factors and university studies in Lebanon. We rely on the Arab Personality Inventory (API) as a personality tool that was developed from and for the Arab world in addition to demographic and university related questions about undergraduate studies.

CHAPTER 3

METHODS

It is important to note that this study received approval from the Institutional Review Board of the American University of Beirut.

3.1. Participants

We collected a sample of data from 1,518 participants from our survey. This total number can be divided into the following sub-groups: 713 full submissions, 785 participants who did not fully submit, and 20 participants who partially submitted. To be considered as a participant who partially submitted, then that would mean that up to 25% of the participant's data is missing or not filled. Being that that is the case, those participants can and were involved in the analysis of data without affecting the quality of results in general. However, participants who had missing data beyond 25% were considered to be the participants who did not fully submit. Those participants were disregarded during the process of data analysis. This was done in order to maintain the quality of data for analysis. Hence, the total number of participants whose results were used in this study equate to 733.

Full Submissions	No Full Submissions	Partial Submissions	**Total**
713	785	20	1,581

Table 1. Total number of participants divided per category.

Of the participants who have fully submitted or partially submitted their responses, around 57% of the sample are females, 42% are males and the remaining

participants answered either “Other” or “Prefer not to say”. Moreover, the majority of the participants were between the ages of 18 to 30 (79%), 18% were between the ages of 31 to 50, 2% of the participants were in the range of 51 to 65, and the remaining participants were above 65 years old. To add to that, the majority of the participants had a Lebanese nationality (92%), 3% had a Saudi Arabian nationality, and the remaining participants came from various nationalities such as American, Palestinian, Syrian, Armenian, and French. In addition, 13% of participants have a dual nationality and 87% do not. Finally, 26% lived in countries beyond their first and/or dual nationality and 74% did not.

Questions	Total
Are you currently enrolled in a university in Lebanon?	
Yes	402 (54.84%)
No	331 (45.16%)
I am currently pursuing a(n):	
Bachelor Freshman	23 (3.14%)
Bachelor Sophomore	45 (6.14%)
Bachelor Junior	90 (12.28%)
Bachelor Senior	62 (8.46%)
Masters	176 (24.01%)
PhD =	6 (0.82%)
What university are/were you enrolled in (Current/Past Students)?	
Al-Kafaat University	6 (0.27%)
American University of Beirut	36 (1.64%)
American University of Culture and Education	735 (33.42%)
American University of Science and Technology	4 (0.18%)
American University of Technology	1 (0.05%)
Antonine University	9 (0.41%)
Arab Open University	33 (1.50%)
Arts, Sciences and Technology University	9 (0.20%)
Beirut Arab University	9 (0.41%)
CNAM	4 (0.18%)
Hagazian University	2 (0.09%)
Islamic University of Lebanon	2 (0.09%)
Lebanese American University	12 (0.55%)

Lebanese Canadian University	1 (0.05%)
Lebanese French University of Technology and Applied Sciences	1 (0.05%)
Lebanese German University	1 (0.05%)
Lebanese International University	19 (0.86%)
Lebanese University	73 (3.32%)
Middle East University	6 (0.14%)
Notre Dame University	14 (0.64%)
Universite La Sagesse	21 (0.95%)
Universite Sainte Esprit De Kaslik	17 (0.77%)
Universite Sainte Joseph	23 (1.05%)
University of Balamand	8 (0.36%)
University of Science and Arts	1 (0.05%)
Have you graduated with an undergraduate degree within the last 2 years?	
Yes	162 (22.10%)
No	351 (47.89%)

Table 2. Summary of the Participants' Responses.

3.2. Procedure

We recruited potential participants through targeted advertising on social media (Facebook and Instagram), mass emails, and snowballing techniques. Online ads were added to the respective platforms and were modified when needed to attempt to reach a high number of conversions. Moreover, mass emails were sent to current undergraduate and graduate students of the American University of Beirut informing them of the study and all the needed details if they are interested to participate.

3.3. Instrument

In order to investigate the aforementioned research question of this study; an online survey has been created to collect all the necessary information and data. If participants voluntarily wanted to participate in the survey, they were redirected to an online website that we had developed specifically for this study. This website was hosted on OVHcloud, which offers the most powerful anti-DDOS attacks. The survey was

created in two languages; Arabic and English. Also, the survey took around 25 minutes to complete, and participants did have the option to finish the survey in multiple sittings. The survey consisted of demographic questions, university-related questions, and the API short (Check Appendix for full list of questions). The answer options consisted of five point likert scales (Strongly Disagree to Strongly Agree), drop-down lists, and multiple-choice answers. In addition, in order to incentivize participation, those who completed the survey in full were provided with a "personality description". Those descriptions were previously calculated and written throughout the development of the API (Zeinoun et al., 2020).

As previously mentioned, one of the components of the survey is the API-Short. This inventory consists of 52 items that had the strongest psychometric properties and they replicated the seven-factor structure of the full version (Zeinoun et al., 2020). These 52 items are measured through a likert scale and the factors include Intellect, Agreeableness, Emotional Stability, Extroversion, Unconventionality, Conscientiousness, and Honesty/Humility/Integrity (Zeinoun et al., 2020). Factor scores are calculated by reversing (if need be) and adding the values of the items per factor and converting the raw scores to z-scores against the mean and standard deviation of the original sample in the Levant (Zeinoun et al., 2020). It is important to note that the Cronbach Alpha Reliability for the API factors ranged between 0.69 and 0.87. In addition, the correlation between the API factors ranged from 0.09 to 0.48. Finally, construct validity of the API was gathered by examining the convergent and divergent validity with the global self-esteem and primary psychopathy scales (Zeinoun et al., 2020).

3.4. Data Analysis

The main research question in this study is to identify different combinations of API factors-scores that contribute to students feeling better fit in their educational fields. The main form of analysis used in this study in order to answer the aforementioned question is Association Rule Mining and the Apriori Algorithm.

Association rules are one of the most popular ways of describing a close correlation between frequent items (Garcia et al., 2011). In other words, an X⇒Y type association rule expresses a close correlation between items (Garcia et al., 2011). There are many different types of algorithms for association rule discovery (Khurana & Sharma, 2013). Some of which include AIS, SETM, AprioriTid, etc… (Khurana & Sharma, 2013). However, one of the most well-known and used algorithm is Apriori (Garcia et al, 2011). Most association rule mining algorithms require the user to set at least two thresholds; three of which will be discussed (Garcia et al., 2011). One parameter is the support which is defined to be the probability that an entry has of satisfying both X and Y (Garcia et al., 2011). Another parameter is the confidence which is defined as the probability an entry has of satisfying Y when it satisfies X (Garcia et al., 2011). Also, there is the lift which is defined as the ratio of 'Confidence' and 'Expected Confidence' (Soni et al., 2020). This algorithm is a data mining technique that can be applied in various fields, such as marketing, bioinformatics, education field, etc… (Kaur & Kang, 2016).

In order to implement this algorithm, specific data had to be added into a new data-frame and pre-processed in a certain manner. To begin with, many participants of different educational backgrounds have fully completed the survey and received their respective results. Our survey was built in a way to only ask major-related questions given that either one of the two requirements are met:

- Participants are current Junior or Senior undergraduates in a university in Lebanon
- Participants have graduated with an undergraduate degree from a university in Lebanon within the last two years

This has been done intentionally since it could increase the reliability of the data. In other words, freshman students are usually not yet enrolled in their major of choice and may not be able to provide accurate information about their personality being the right fit in the field. Also, sophomore students may not necessarily be aware enough to be able to know if they have the right personality fit for their field of interest. Moreover, targeting participants who had graduated over a long period of time might have their answer to the major-personality fit question affected by external factors such as the inability to find a job in one's field, lack of proper pay etc…. Hence, we had decided to set a limited time-frame of two years at most. With that being said, the first important step was to only include the below discussed data into a new data-frame from the sample pinpointed above.

Moreover, the scoring for each participant was added to the new data-frame. However, it is important to note that the value of the seven factors could range in the following sense:

- Less than negative one
- Between negative and positive one
- Greater than positive one

In order to conduct the Apriori algorithm efficiently, it was important to combine the scores data into three categories: "Low", "Medium", and "High" respectively. Hence, each participant (entry) had their respective seven scores translated into one of three groups based on their value.

Finally, it was also important to incorporate the majors chosen per participant. The first sub-focus was on their current major, or the major they pursued two years ago at most. If they had answered a "Yes" to the question that asks if they feel/felt that their personality is fit for this major, then this major was included in the analysis. Otherwise, it was not included. In addition, the second sub-focus was on the majors that the participant chose to include as an answer to the survey question "What other majors in your opinion would suit you?" All those majors were included in the analysis.

It is important to note that the same participant could have stated that:

- They think they had the right personality fit to their current (or past) major and stated other majors they would assume they fit into
- They do not think that they have the right personality fit for their current or past major of choice, but also chose other majors (more than one choice) they would think they fit into

In either case, each participant had multiple majors they see themselves fit into from a personality perspective. In such a situation, each major was separated into a new entry or row per the same user. Hence, instead of having 733 total submissions, by splitting the majors into new rows, this led to a total entries of 821. This was done in order to understand the aforementioned research question and identify the different combinations of personality profiles and by how much they would increase the probability of students feeling more personality fit into certain fields.

Based on the previous pre-processing, an Association Rule Mining and Apriori algorithm was then implemented with the following parameters: Support = 0.001, Confidence = 0.01, Minimum Length = 3.

Despite lowering the minimum support and confidence, as presented through the figure below, the result showed a number of rules having a maximum count of 13 (Support = 0.02), which is not sufficient enough to use and build our results.

Rules	**Support**	**Confidence**	**Lift**	**Count**
{Agreeableness-MEDIUM, Extroversion-MEDIUM} => {Psychology Research & Experimental Psychology}	0.02	0.04	1.10	13
{Agreeableness-MEDIUM, Unconventionality-MEDIUM} => {Psychology Research & Experimental Psychology}	0.02	0.03	0.96	13
{Emotional Stability-MEDIUM, Unconventionality-MEDIUM} => {Arts, Entertainment, Theatre, and Media Management}	0.01	0.05	1.60	12
{Extroversion-MEDIUM, Unconventionality-MEDIUM} => {Arts, Entertainment, Theatre, and Media Management}	0.01	0.04	1.32	12
{Agreeableness-MEDIUM, Honesty/Humility/Integrity-MEDIUM} => {Psychology Research & Experimental Psychology}	0.01	0.04	1.08	12
{Intellect-MEDIUM, Unconventionality-MEDIUM} => {Psychology Research & Experimental Psychology}	0.01	0.04	1.03	12
{Extroversion-MEDIUM, Unconventionality-MEDIUM} => {Psychology Research & Experimental Psychology}	0.01	0.04	1.09	12

Table 3. Rules with a minimum count of 12 - Grouped by university majors

Based on this, the majors inputted by the participants were then grouped into four separate and distinct fields:

- Sciences and Social Sciences: This field includes all types of Sciences and Social Sciences majors such as but not limited to Chemistry, Psychology, etc… (n = 433)

- Business: This field includes all the majors that can be grouped under the Business realm such as Accounting and Auditing, Finance, etc… (n = 179)
- Arts: This field involves all majors related to Fine Arts, Dance, Radio and TV etc… (n = 120)
- Architecture and Engineering: This field includes all types of Engineering and Architecture related majors (Chemical Engineering, Architecture, etc...) (n = 89)

This was done intentionally as a means to increase the count and support available and in that way be able to draw conclusions or results.

CHAPTER 4
RESULTS

In order for us to pull the relatively best results from the available data, the Apriori and Association Rule Mining Algorithm was applied while modifying the parameter of the minimum support in a way that is best fit for each subset of data (which is per field). It is also important to note that the minimum length parameter was set to be a constant of five. This would mean that at least 4 factors are included in the rules. This was done because increasing this value would have decreased the overall count and support over the rules or even the number of rules in general since we are increasing the requirements or number of factors that are expected to be present. Hence, we had decided to at least show half the number of total factors. Also, the minimum confidence was set to 0.1 in order to find more rules which were then sorted via lift (which balances the choice of a low confidence) and the top 10 rules were taken.

4.1. Sciences and Social Sciences

In the Sciences and Social Sciences field, the support parameter was set to 0.05. From which, the data was sorted via the lift value and the top 10 rules are presented below.

Sciences & Social Sciences				
Rules	**Support**	**Confidence**	**Lift**	**Count**
{Agreeableness-MEDIUM, Extroversion-MEDIUM, Honesty/Humility/Integrity-LOW, Unconventionality-MEDIUM} => {Sciences & Social Sciences}	0.07420925	0.6777778	1.2866821	61
{Agreeableness-MEDIUM, Conscientiousness-LOW, Emotional Stability-LOW, Extroversion-MEDIUM, Unconventionality-	0.05717762	0.6714286	1.2746288	47

MEDIUM} => {Sciences & Social Sciences}				
{Agreeableness-MEDIUM, Conscientiousness-LOW, Emotional Stability-LOW, Extroversion-MEDIUM} => {Sciences & Social Sciences}	0.06690998	0.6626506	1.2579649	55
{Agreeableness-MEDIUM, Extroversion-MEDIUM, Honesty/Humility/Integrity-LOW, Intellect-MEDIUM} => {Sciences & Social Sciences}	0.05231144	0.6615385	1.2558536	43
{Agreeableness-MEDIUM, Conscientiousness-LOW ,Extroversion-MEDIUM, Honesty/Humility/Integrity-LOW} => {Sciences & Social Sciences}	0.06082725	0.6578947	1.2489364	50
{Agreeableness-MEDIUM, Conscientiousness-LOW, Honesty/Humility/Integrity-LOW, Unconventionality-MEDIUM} => {Sciences & Social Sciences}	0.05352798	0.6567164	1.2466995	44
{Conscientiousness-LOW, Emotional Stability-LOW, Extroversion-MEDIUM, Unconventionality-MEDIUM} => {Sciences & Social Sciences}	0.0620438	0.6455696	1.2255386	51
{Agreeableness-MEDIUM, Conscientiousness-LOW, Emotional Stability-LOW, Unconventionality-MEDIUM} => {Sciences & Social Sciences}	0.0620438	0.6455696	1.2255386	51
{Agreeableness-MEDIUM, Emotional Stability-LOW, Extroversion-MEDIUM, Intellect-MEDIUM} => {Sciences & Social Sciences}	0.06934307	0.6333333	1.2023095	57
{Emotional Stability-LOW, Extroversion-MEDIUM, Intellect-MEDIUM, Unconventionality-MEDIUM} => {Sciences & Social Sciences}	0.05961071	0.6282051	1.1925742	49

Table 4. The top 10 rules in the Sciences and Social Sciences field

These top 10 rules can be translated into the below results:

- If a student scores a medium score on Agreeableness, Extroversion, Unconventionality, and a low score on Honesty/Humility/Integrity => Then, this person is more likely to be feel better fit in majors related to the Sciences & Social Sciences field by 29%
- If a student scores a medium score on Agreeableness, Extroversion, Unconventionality, and a low score on Conscientiousness and Emotional Stability => Then, this person is more likely to be feel better fit in majors related to the Sciences & Social Sciences field by 27%
- If a student scores a medium score on Agreeableness and Extroversion, and a low score on Conscientiousness and Emotional Stability => Then, this person is more likely to be feel better fit in majors related to the Sciences & Social Sciences field by 26%
- If a student scores a medium score on Agreeableness, Extroversion and Intellect, and a low score on Honesty/Humility/Integrity => Then, this person is more likely to be feel better fit in majors related to the Sciences & Social Sciences field by 26%
- If a student scores a medium score on Agreeableness and Extroversion, and a low score on Conscientiousness and Honesty/Humility/Integrity => Then, this person is more likely to be feel better fit in majors related to the Sciences & Social Sciences field by 25%
- If a student scores a medium score on Agreeableness and Unconventionality, and a low score on Conscientiousness and Honesty/Humility/Integrity => Then, this person is more likely to be feel better fit in majors related to the Sciences & Social Sciences field by 25%

- If a student scores a medium score on Extroversion and Unconventionality, and a low score on Conscientiousness and Emotional Stability => Then, this person is more likely to be feel better fit in majors related to the Sciences & Social Sciences field by 23%
- If a student scores a medium score on Agreeableness and Unconventionality, and a low score on Conscientiousness and Emotional Stability => Then, this person is more likely to be feel better fit in majors related to the Sciences & Social Sciences field by 23%
- If a student scores a medium score on Agreeableness, Intellect and Extroversion and a low score on Emotional Stability => Then, this person is more likely to be feel better fit in majors related to the Sciences & Social Sciences field by 20%
- If a student scores a medium score on Extroversion, Intellect and Unconventionality and a low score on Emotional Stability => Then, this person is more likely to be feel better fit in majors related to the Sciences & Social Sciences field by 19%

4.2. Business

In the Business field, the support parameter was set to 0.02. From which, the data was sorted via the lift value and the top 10 rules are presented below.

Business				
Rules	**Support**	**Confidence**	**Lift**	**Count**
{Conscientiousness-MEDIUM, Emotional Stability-LOW, Honesty/Humility/Integrity-MEDIUM, Unconventionality MEDIUM} => {Business}	0.020681	0.3953488	1.8155125	17

{Conscientiousness-MEDIUM, Extroversion-MEDIUM, Honesty/Humility/Integrity-MEDIUM, Unconventionality-MEDIUM} => {Business}	0.024331	0.3636364	1.6698832	20
{Agreeableness-MEDIUM, Conscientiousness-MEDIUM, Emotional Stability-MEDIUM, Unconventionality-MEDIUM} => {Business}	0.021898	0.3461538	1.5896003	18
{Emotional Stability-MEDIUM, Extroversion-MEDIUM, Honesty/Humility/Integrity-MEDIUM, Intellect-MEDIUM} => {Business}	0.023114	0.3454545	1.586389	19
{Agreeableness-MEDIUM, Conscientiousness-MEDIUM, Extroversion-LOW, Unconventionality-MEDIUM} => {Business}	0.021898	0.3333333	1.5307263	18
{Conscientiousness-MEDIUM, Emotional Stability-MEDIUM, Extroversion-MEDIUM, Honesty/Humility/Integrity-MEDIUM} => {Business}	0.024331	0.3278689	1.5056324	20
{Extroversion-MEDIUM, Honesty/Humility/Integrity-MEDIUM, Intellect-MEDIUM ,Unconventionality-MEDIUM} => {Business}	0.025547	0.3134328	1.4393396	21
{Agreeableness-MEDIUM, Conscientiousness-MEDIUM, Honesty/Humility/Integrity-MEDIUM, Unconventionality-MEDIUM} => {Business}	0.029197	0.3116883	1.4313284	24
{Emotional Stability-MEDIUM, Extroversion-MEDIUM, Honesty/Humility/Integrity-MEDIUM, Unconventionality-MEDIUM} => {Business}	0.026764	0.2972973	1.3652423	22
{Agreeableness-MEDIUM, Conscientiousness-MEDIUM, Emotional Stability-MEDIUM, Extroversion-MEDIUM} => {Business}	0.021898	0.295082	1.3550691	18

Table 5. The top 10 rules in the Business field

These top 10 rules can be translated into the below results that best explain the aforementioned research question.

- If a student scores a medium score on Conscientiousness, Honesty/Humility/Integrity, and Unconventionality, and a low score on Emotional Stability => Then, this person is more likely to feel better fit in majors related to the Business field by 82%
- If a student scores a medium score on Conscientiousness, Extroversion, Honesty/Humility/Integrity, and Unconventionality => Then, this person is more likely to feel better fit in majors related to the Business field by 67%
- If a student scores a medium score on Agreeableness, Conscientiousness, Emotional Stability, and Unconventionality => Then, this person is more likely to feel better fit in majors related to the Business field by 59%
- If a student scores a medium score on Emotional Stability, Extroversion, Honesty/Humility/Integrity, and Intellect => Then, this person is more likely to feel better fit in majors related to the Business field by 59%
- If a student scores a medium score on Agreeableness, Conscientiousness and Unconventionality, and a low score on Extroversion => Then, this person is more likely to feel better fit in majors related to the Business field by 53%
- If a student scores a medium score on Conscientiousness, Emotional Stability, Extroversion, and Honesty/Humility/Integrity => Then, this person is more likely to feel better fit in majors related to the Business field by 51%

- If a student scores a medium score on Extroversion, Honesty/Humility/Integrity, Intellect, and Unconventionality => Then, this person is more likely to feel better fit in majors related to the Business field by 44%
- If a student scores a medium score on Agreeableness, Conscientiousness, Honesty/Humility/Integrity, and Unconventionality => Then, this person is more likely to feel better fit in majors related to the Business field by 43%
- If a student scores a medium score on Emotional Stability, Extroversion, Honesty/Humility/Integrity, and Unconventionality => Then, this person is more likely to feel better fit in majors related to the Business field by 37%
- If a student scores a medium score on Agreeableness, Conscientiousness, Emotional Stability, and Extroversion => Then, this person is more likely to feel better fit in majors related to the Business field by 36%

4.3. Arts

In the Arts field, the support parameter was set to 0.018. From which, the figure below represents the top 10 rules sorted by lift.

Art				
Rules	**Support**	**Confidence**	**Lift**	**Count**
{Agreeableness-MEDIUM, Conscientiousness-LOW, Emotional Stability-MEDIUM, Intellect-MEDIUM} => {Arts}	0.018248	0.3333333	2.283333	15

{Conscientiousness-MEDIUM, Honesty/Humility/Integrity-LOW, Intellect-MEDIUM, Unconventionality-MEDIUM} => {Arts}	0.019465	0.32	2.192	16
{Conscientiousness-LOW, Emotional Stability-MEDIUM, Honesty/Humility/Integrity-MEDIUM, Intellect-MEDIUM} => {Arts}	0.019465	0.3137255	2.14902	16
{Agreeableness-MEDIUM, Conscientiousness-LOW, Emotional Stability-MEDIUM, Honesty/Humility/Integrity-MEDIUM, Unconventionality-MEDIUM} => {Arts}	0.020681	0.2982456	2.042983	17
{Conscientiousness-LOW, Emotional Stability-MEDIUM, Intellect-MEDIUM, Unconventionality-MEDIUM} => {Arts}	0.020681	0.2881356	1.973729	17
{Conscientiousness-LOW, Emotional Stability-MEDIUM, Honesty/Humility/Integrity-MEDIUM, Unconventionality-MEDIUM} => {Arts}	0.024331	0.2857143	1.957143	20
{Agreeableness-MEDIUM, Conscientiousness-LOW, Emotional Stability-MEDIUM, Honesty/Humility/Integrity-MEDIUM} => {Arts}	0.024331	0.2816901	1.929578	20
{Agreeableness-MEDIUM, Conscientiousness-LOW, Emotional Stability-MEDIUM, Unconventionality-MEDIUM} => {Arts}	0.025547	0.28	1.918	21
{Conscientiousness-LOW, Emotional Stability-MEDIUM, Extroversion-LOW, Unconventionality-MEDIUM} => {Arts}	0.018248	0.2542373	1.741525	15
{Agreeableness-MEDIUM, Emotional Stability-MEDIUM, Honesty/Humility/Integrity-MEDIUM, Intellect-MEDIUM} => {Arts}	0.020681	0.2361111	1.617361	17

Table 6. The top 10 rules in the Arts field

These top 10 rules can be translated into the below results:

- If a student scores a medium score on Agreeableness, Emotional Stability, and Intellect, and a low score on Conscientiousness => Then, this person is more likely to feel better fit in majors related to the Arts field by 128%
- If a student scores a medium score on Conscientiousness, Intellect and Unconventionality, and a low score on Honesty/Humility/Integrity => Then, this person is more likely to feel better fit in majors related to the Arts field by 119%
- If a student scores a medium score on Emotional Stability, Honesty/Humility/Integrity and Intellect, and a low score on Conscientiousness => Then, this person is more likely to feel better fit in majors related to the Arts field by 115%
- If a student scores a medium score on Agreeableness, Emotional Stability, Honesty/Humility/Integrity and Unconventionality and a low score on Conscientiousness => Then, this person is more likely to feel better fit in majors related to the Arts field by 104%
- If a student scores a medium score on Emotional Stability, Intellect, Unconventionality and a low score on Conscientiousness => Then, this person is more likely to feel better fit in majors related to the Arts field by 97%
- If a student scores a medium score on Emotional Stability, Honesty/Humility/Integrity and Unconventionality, and a low score on Conscientiousness => Then, this person is more likely to feel better fit in majors related to the Arts field by 96%

- If a student scores a medium score on Agreeableness, Emotional Stability, Honesty/Humility/Integrity, and a low score on Conscientiousness => Then, this person is more likely to feel better fit in majors related to the Arts field by 93%
- If a student scores a medium score on Agreeableness, Emotional Stability, Unconventionality, and a low score on Conscientiousness => Then, this person is more likely to feel better fit in majors related to the Arts field by 92%
- If a student scores a medium score on Emotional Stability and Unconventionality, and a low score on Conscientiousness and Extroversion => Then, this person is more likely to feel better fit in majors related to the Arts field by 74%
- If a student scores a medium score on Agreeableness, Emotional Stability, Intellect , and Honesty/Humility/Integrity => Then, this person is more likely to feel better fit in majors related to the Arts field by 62%

4.3. Architecture and Engineering

In the Architecture and Engineering field, the support parameter was set to 0.013. The top 10 rules are presented below.

Engineering & Architecture				
Rules	**Support**	**Confidence**	**Lift**	**Count**
Agreeableness-MEDIUM, Emotional Stability-MEDIUM, Honesty/Humility/Integrity-MEDIUM, Intellect-MEDIUM}	0.014599	0.1666667	1.539326	12
{Agreeableness-MEDIUM, Emotional Stability-MEDIUM, Honesty/Humility/Integrity-MEDIUM,	0.018248	0.1546392	1.42824	15

Unconventionality-MEDIUM} => {Engineering & Architecture}				
{Agreeableness-MEDIUM, Conscientiousness-LOW, Honesty/Humility/Integrity-MEDIUM, Unconventionality-MEDIUM} => {Engineering & Architecture}	0.019465	0.152381	1.407384	16
{Agreeableness-MEDIUM, Honesty/Humility/Integrity-MEDIUM, Intellect-MEDIUM, Unconventionality-MEDIUM} => {Engineering & Architecture}	0.020681	0.1452991	1.341976	17
{Extroversion-LOW, Honesty/Humility/Integrity-MEDIUM, Intellect-MEDIUM, Unconventionality-MEDIUM} => {Engineering & Architecture}	0.013382	0.1428571	1.319422	11
{Agreeableness-MEDIUM, Conscientiousness-LOW, Intellect-MEDIUM, Unconventionality-MEDIUM} => {Engineering & Architecture}	0.014599	0.1304348	1.20469	12
{Agreeableness-MEDIUM, Emotional Stability-MEDIUM, Intellect-MEDIUM, Unconventionality-MEDIUM} => {Engineering & Architecture}	0.013382	0.1264368	1.167764	11
{Agreeableness-MEDIUM, Conscientiousness-LOW, Extroversion-MEDIUM, Unconventionality-MEDIUM} => {Engineering & Architecture}	0.017032	0.125	1.154494	14
{Agreeableness-MEDIUM, Extroversion-MEDIUM, Honesty/Humility/Integrity-MEDIUM, Unconventionality-MEDIUM} => {Engineering & Architecture}	0.015815	0.1238095	1.143499	13
{Emotional Stability-MEDIUM, Honesty/Humility/Integrity-MEDIUM, Intellect-MEDIUM, Unconventionality-MEDIUM} => {Engineering & Architecture}	0.013382	0.1235955	1.141523	11

Table 7. Top 10 rules in the Engineering and Architecture field

These top 10 rules can be translated into the below results:

- If a student scores a medium score on Agreeableness, Emotional Stability, Honesty/Humility/Integrity, and intellect => Then, this person is more likely to feel better fit in majors related to the Engineering and Architecture field by 54%
- If a student scores a medium score on Agreeableness, Emotional Stability, Honesty/Humility/Integrity, and Unconventionality => Then, this person is more likely to feel better fit in majors related to the Engineering and Architecture field by 43%
- If a student scores a medium score on Agreeableness, Honesty/Humility/Integrity, and Unconventionality, and a low score on Conscientiousness => Then, this person is more likely to feel better fit in majors related to the Engineering and Architecture field by 41%
- If a student scores a medium score on Agreeableness, Honesty/Humility/Integrity, Intellect, and Unconventionality => Then, this person is more likely to feel better fit in majors related to the Engineering and Architecture field by 34%
- If a student scores a medium score on Honesty/Humility/Integrity, Intellect, Unconventionality, and a low score on Extroversion => Then, this person is more likely to feel better fit in majors related to the Engineering and Architecture field by 32%
- If a student scores a medium score on Agreeableness, Intellect, Unconventionality, and a low score on Conscientiousness => Then, this person is more likely to feel better fit in majors related to the Engineering and Architecture field by 21%

- If a student scores a medium score on Agreeableness, Emotional Stability, Intellect, and Unconventionality => Then, this person is more likely to feel better fit in majors related to the Engineering and Architecture field by 17%
- If a student scores a medium score on Agreeableness, Extraversion, Unconventionality, and low on Conscientiousness => Then, this person is more likely to feel better fit in majors related to the Engineering and Architecture field by 15%
- If a student scores a medium score on Agreeableness, Extroversion, Honesty/Humility/Integrity, and Unconventionality => Then, this person is more likely to feel better fit in majors related to the Engineering and Architecture field by 14%
- If a student scores a medium score on Emotional Stability, Honesty/Humility/Integrity, Intellect, and Unconventionality => Then, this person is more likely to feel better fit in majors related to the Engineering and Architecture field by 14%

CHAPTER 5
DISCUSSION

Based on the above, different combinations of the personality factors have been studied and we have been able to identify how each of these combinations increase the probability that this student with such a profile would feel better fit in majors of the field mentioned on the right hand side of the rules.

As a means of digging deeper into the results presented above, the first step taken was to look into the forty rules (ten rules per field) presented and check for the presence of any duplicate rules across different fields. One duplicate rule was found and is presented below:

Rule	**Support**	**Confidence**	**Lift**	**Count**
{Agreeableness-MEDIUM, Emotional Stability-MEDIUM, Honesty/Humility/Integrity-MEDIUM, Intellect-MEDIUM} => {Arts}	0.02068127	0.2361111	1.6173611	17
{Agreeableness-MEDIUM, Emotional Stability-MEDIUM, Honesty/Humility/Integrity-MEDIUM, Intellect-MEDIUM} => {Engineering}	0.01459854	0.1666667	1.539326	12

Table 8. Duplicate rules

In others words, if a student scores a medium score on agreeableness, emotional stability, honesty/humility/integrity, and intellect, then this student is more likely to feel better fit in majors related to the Arts and Engineering fields by 62% and 54% respectively.

Moreover, the most and least repetitive factor and their respective score per field was looked into and identified as presented in the figure below.

Field	Most Repetitive	Least Repetitive
Sciences & Social Sciences	Unconventionality **Medium**	Agreeableness **High**
Business	Unconventionality **Medium**	Unconventionality **High**
Arts	Unconventionality **Medium**	Honesty/Humility/Integrity **High**
Engineering & Architecture	Unconventionality **Medium**	Honesty/Humility/Integrity **High**

Table 9. Most and least repetitive factor-score per field

An insight that can be drawn from this is the fact that the majority of the people from all the different fields and majors seem to have a medium score on the unconventionality feature. Moreover, in reference to the table above, the least repetitive factor-score for the Business field is a high score on unconventionality. Hence, in the business field specifically, the majority of students have a medium score in unconventionality, the remaining majority would be scoring a low score, and the rest would have a high score. As per the description of this factor-score, one does not see themselves as someone who is very traditional and nor someone who identifies as a counter-culture (Zeinoun et al., 2017).

Based on the above finding, one can assume that this factor and its rating is not a signifier or differentiator between the fields. In other words, this factor-score, alone, is not a strong predictor to differentiate between the educational fields. On the other hand, it seems to be the dominant factor-score regardless of educational background. Based on a study conducted by Abduljaber (2018), "…increasing rates of modernization in the Arab world over the past half century have led to a moving away from religion and tradition to embracing more secular and liberal values". With that being said, one may also make an inference about the sample at hand (whose majority is between the ages of

18 to 31 years old - 79%), that this age group, in recent times, could be considered as the midway on a scale of traditions and culture. They are not super traditional, nor considered as counter cultures regardless of educational background. The reason behind this inference is the idea proposed by Abduljaber (2018) in which the Arab world is now moving to a midway between both extremes.

Moreover, we attempted to look into the second most repetitive factor-score per field. As presented below, this repetitive factor-score across all fields is agreeableness-medium. The description behind such a factor-score is someone who is generally considerate and tolerant of others (Zeinoun et al., 2017). He/she likes to treat people equally and is a pleasant person to have around (Zeinoun et al., 2017).

Field	Most Repetitive
Sciences & Social Sciences	**Agreeableness** Medium
Business	Agreeableness **Medium**
Arts	Agreeableness **Medium**
Engineering & Architecture	Agreeableness **Medium**

Table 10. Second level - Most repetitive factor score across fields.

As noted in a study conducted by Vedel et al. (2015), one of the hypotheses that was focused on was that "female students will score higher than male students on neuroticism, extraversion, agreeableness, and conscientiousness" across a wide range of educational fields such as Medicine, Psychology, Law, Economics, Political Science, Science, and Arts/Humanities. This hypothesis was proven true such that female students scored significantly higher on neuroticism, agreeableness, and conscientiousness than male students on the Big Five personality traits (Vedel et al., 2015). With that being said,

the data collected for this research was looked into and 62% of the participants were female. Hence, this could be the reason behind having a factor-score of Agreeableness – medium as the second level repetitive one across all the fields of interest. However, since this percentage is not a relatively high one, then future studies can attempt to collect more data and further look into this specific aspect.

Finally, we looked into the third most repetitive factor-score across different fields. As presented below, the most repetitive factor-score is extroversion - medium in the fields of Business and Sciences and Social Sciences. In addition, the third level most repetitive factor-score is honesty/humility/integrity – medium in the fields of Engineering and Architecture and Arts.

Field	Most Repetitive
Business	Extroversion **Medium**
Sciences & Social Sciences	Extroversion **Medium**
Arts	Honesty/Humility/Integrity **Medium**
Engineering & Architecture	Honesty/Humility/Integrity **Medium**

Table 11. Third level - Most repetitive factor-score across fields.

As noted by Shahzad et al., (2013), Business majors scored higher on extroversion as compared to non-business majors. This difference is understandable as the nature of this major goes with the extroversion style (Shahzad et al., 2013). It has been observed that extroverts in business occupations are more in numbers than extroverts in non-business occupations (Shahzad et al., 2013). Hence, this could be a similar reasoning as to why the repetitive score is medium. The asset of people in Business majors or fields is their ability to enjoy large people settings and be a people's person when need be. Having

this part of your personality (at least as a medium) can ensure success later on. As for the Sciences and Social Sciences field, then previous studies have shown that Sciences majors score low on Extroversion (Vedel et al., 2015). However, it is important to note that Science majors in the previous study included specific majors such as Chemistry, Mathematics, and Physics. The Sciences and Social Sciences field in this study includes those majors as well as majors such as Psychology, Education, Medicine, Nursing, and Media etc. Based on an article by Vedel et al. (2015), medicine majors scored high on extroversion. Also, as noted by Hartmann and Ertl (2021), those studying and aspiring to have a teaching profession have been characterized with higher extroversion. Hence, these could come to show the reason behind finding the extroversion-medium as a third level repetitive factor in the Sciences and Social Sciences field. Such majors could be expected to have a medium score on extroversion as it involves communication and interaction with people and being able to handle social settings.

On a similar note, the most repetitive factor-score for the fields of Engineering and Architecture and Arts is honesty/humility/integrity - medium. A person with this factor score is usually described as someone with a balance between being candid and hiding the truth when deemed necessary (Zeinoun et al., 2017). Moreover, you are a grateful person, who takes pride in being ethical and moral (Zeinoun et al., 2017). Since we were unable to understand the link of this factor to the aforementioned fields, we decided to look further into the data. Doing so did not lead us to find any unusual data that could affect and lead to this result. With that being said, a medium score on honesty/humility/integrity could be a unique identifier to both fields. Future studies can also look into this field and further look into the conclusions reached.

CHAPTER 6
LIMITATIONS

Our study poses some limitations. First of all, it is important to increase our forms of data collection or the time period allocated for this stage. Our current form of data collection was through mass emails, online ads, and snowballing techniques. From which, this brings us to the second limitation which is the sample size.

Future studies can further increase the data collection and sample size. Doing so could yield multiple benefits. For example, future research can look into the relationship between all seven factors (instead of four) and specific educational majors (instead of fields). Also, more data could help gain more information about the repetitive factors (second level: agreeableness-medium, and third level: honesty/humility/integrity-medium).

CHAPTER 7
CONCLUSION

Based on the results presented above, we were able to identify the relationship between different personality API factor-scores and the different educational fields. Different combinations of the personality factors have been taken into consideration. From which, it has been highlighted how each of these combinations increase the probability that this student with such profile would feel better fit in majors of the field of interest. Future studies can build on the presented study, and take into consideration the limitations specified above. Moreover, future studies can also attempt to look into extreme or random responding occurrences from different participants. If such occurrences are to be present, then studies can look into how the data collected was affected due to this.

APPENDIX

12.1. Survey Questions

API Questions:

- I am humble
- I am studious
- I am an anxious person
- I am entertaining to those around me
- I sometimes like it when others feel sorry for me
- I have depth, as a person
- When life is good, it is because God meant it as such
- I am fair to/with others
- I am skillful
- I am depressed
- I am fun-loving
- I am tyrannical
- I am wise
- I encourage others for the better
- I am successful at my work/study
- I laugh a lot
- I tend to make others feel guilty for not meeting expectations
- I abide by my religious duties
- I like to reach others
- I am committed to my work/study
- I am impulsive in my behaviors
- I am a sociable person
- I am a greedy person

- I am inquisitive
- I come from a family of good social standing
- I am practical
- I feel internal conflicts between myself and society
- I make others laugh
- I am intelligent
- I love my nation
- I am respectful
- I am a moody person
- I am exploitative
- I am sophisticated
- Preserving my honor is very important to me
- I am altruistic
- I get angry easily
- I am rational in what I do
- I am a conservative person
- I feel with others
- I am energetic
- I get bored easily
- I think realistically about situations
- I strike a balance between openness and conservativeness
- I am tolerant of others' opinions
- I have a charismatic presence
- I always have creative ideas
- I am a stubborn person
- I am pleasant to be around
- I am annoying

- My comments are well thought of
- I am secular

Demographic Questions (Some questions in the remaining two categories are conditional)

- How old are you?
- What is your sex?
- What is the country of your nationality?
- Do you have a dual nationality?
- What is the country of your dual nationality?
- Have you lived in countries (or a country) other than the one(s) stated previously?
- Where have you lived?
- Which country have you lived the longest in or associate with the most?

Major-Related Questions

- Are you currently enrolled in a university in Lebanon?
- I am currently pursuing a(n):
- What university are you enrolled in? [Available in past tense]
- What faculty are you enrolled in? [Available in past tense]
- What is your current major? [Available in past tense]
- Based on the grades of your major courses, your overall letter grade would be: [Available in past tense]
- Do you think your personality is relatively the most fit for this major? [Available in past tense]
- What other major, in your opinion, would fit you? [Available in past tense]
- Have you graduated with an undergraduate degree from a university in Lebanon within the last two years?

REFERENCES

Abduljaber, M. (2018). Effects of modernization and globalization of values change in the arab world. *Changing Societies & Personalities*, *2*(2), 161–182. https://doi.org/10.15826/csp.2018.2.2.035

Aljojo, N. (2016). Choosing a career based personality matching: A case study of king abdulaziz university. International Journal of Advanced Computer Science and Applications, 7(2). https://doi.org/10.14569/ijacsa.2016.070229

García, E., Romero, C., Ventura, S., & de Garcia, C. (2011). A Collaborative Educational Association Rule Mining Tool. *The Internet and Higher Education*, *14*(2), 77–88. https://doi.org/10.1016/j.iheduc.2010.07.006

Humburg, M. (2012). The Effect of the Big Five Personality Traits on College Major Choice: Evidence from a Dutch longitudinal youth cohort study.

John, R., John, R., & Rao, Z.-ur-R. (2020). The Big Five Personality Traits And Academic Performance. *Journal of Law & Social Studies*, *2*(1), 10–19. https://doi.org/10.52279/jlss.02.01.1019

Kaur, M., & Kang, S. (2016). Market basket analysis: Identify the changing trends of Market Data Using Association Rule Mining. *Procedia Computer Science*, *85*, 78–85. https://doi.org/10.1016/j.procs.2016.05.180

Khurana, K., & Sharma, S. (2013). A Comparative Analysis of Association Rules Mining Algorithms. *International Journal of Scientific and Research Publications, 5 (3)*.

Karataş, H. (2015). Correlation among Academic Procrastination, Personality Traits, and Academic Achievement. Anthropologist, 20, 243-255.

Kothari, T. P., & Pingle, S. S. (2015). Establishing the relationship between marketing specialization and personality traits among management students. Paradigm, 19(2), 170–183. https://doi.org/10.1177/0971890715609856

Kramer, A., Bhave, D. P., & Johnson, T. D. (2014). Personality and group performance: The importance of personality composition and work tasks. Personality and Individual Differences, 58, 132–137. https://doi.org/10.1016/j.paid.2013.10.019

Lakhal, S., Frenette, É., Sévigny, S., & Khechine, H. (2012). Relationship between choice of a business major type (thing-oriented versus person-oriented) and big five personality traits. The International Journal of Management Education, 10(2), 88–100. https://doi.org/10.1016/j.ijme.2012.03.003

Larson, L. M., Wu, T. F., Bailey, D. C., Gasser, C. E., Bonitz, V. S., & Borgen, F. H. (2010). The role of personality in the selection of a major: With and without

vocational self-efficacy and interests. Journal of Vocational Behavior, 76(2), 211–222. https://doi.org/10.1016/j.jvb.2009.10.007

Lundgren, H., Poell, R. F., & Kroon, B. (2019). “This is not a test”: How do human resource development professionals use personality tests as tools of their professional practice? Human Resource Development Quarterly, 30(2), 175–196. https://doi.org/10.1002/hrdq.21338

McCredie, M. N., & Kurtz, J. E. (2020). Prospective Prediction of Academic Performance in College Using Self- and Informant-Rated Personality Traits. Journal of Research in Personality, 85. https://doi.org/10.1016/j.jrp.2019.103911

Miltner, K. M., & Highfield, T. (2017). Never Gonna GIF You Up: Analyzing the Cultural Significance of the Animated GIF. Social Media + Society, 205630511772522. https://doi.org/10.1177/2056305117725223

Naydenova, I., Lounsbury, J. W., Levy, J. J., & Kim, J. Y. (2012). Distinctive Big Five and Narrow Personality Traits of Psychology Majors. *Individual Differences Research*, 10(3), 129-140.

Nye, J. V., Orel, E., & Kochergina, E. (2013). BIG FIVE PERSONALITY TRAITS AND ACADEMIC PERFORMANCE IN RUSSIAN UNIVERSITIES. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.2265395

Sang, J., Zhang, H., & Xu, C. (2016). Visual BFI: an Exploratory Study for Image-based Personality Test. *Lecture Notes in Computer Science*, 95–106. https://doi.org/10.1007/978-3-319-48890-5_10

Shahzad, K., Ahmed, F., & Ghaffar, A. (2013). Personality and Gender as Predictors of Academic Choices: A Comparative Study of Business and Non-Business Students. *International Journal of Management & Organizational Studies*, 2(2).

Soni, A., Saxena, A., & Bajaj, P. (2020). A Methodological Approach for Mining the User Requirements Using Apriori Algorithm. *Journal of Cases on Information Technology (JCIT)*, 22(4), 1-30. http://doi.org/10.4018/JCIT.2020100101

Vedel, A., Thomsen, D. K., & Larsen, L. (2015). Personality, academic majors and performance: Revealing complex patterns. *Personality and Individual Differences*, *85*, 69–76. https://doi.org/10.1016/j.paid.2015.04.030

Virgana, V. (2021). THE EFFECT OF JOB PERFORMANCE THROUGH ORGANIZATIONAL CULTURE, WORK ENVIRONMENT, PERSONALITY, AND MOTIVATION. *Journal of Management and Entrepreneurship*, 22(2), 87-98. https://doi.org/10.9744/jmk.22.2.87–98

Yesil, S., & Sozbilir, F. (2013). An empirical investigation into the impact of personality on Individual Innovation behaviour in the workplace. *Procedia - Social and Behavioral Sciences*, *81*, 540–551. https://doi.org/10.1016/j.sbspro.2013.06.474

Zeinoun, P., Daouk-Öyry, L., Choueiri, L., & van de Vijver, F. J. (2017). A MIXED-METHODS study of personality conceptions in the Levant: Jordan, Lebanon, Syria, and the West Bank. Journal of Personality and Social Psychology. https://doi.org/10.1037/pspp0000148

Zeinoun, P., Daouk-Öyry, L., Choueiri, L., & van de Vijver, F. J. (2017). Arab-Levantine personality structure: A PSYCHOLEXICAL study of modern standard Arabic in Lebanon, Syria, Jordan, and the West Bank. *Journal of Personality*. https://doi.org/10.1111/jopy.12324

Zeinoun, P., Daouk-Öyry, L., Sahakian, T., & Van De Vijver, F. J. (2020). Development and Validation of a Short Version of the Arab Personality Inventory: The API Short. Unpublished manuscript.