



AMERICAN UNIVERSITY OF BEIRUT

THE MODERATING ROLE OF OPENNESS AND  
(UN)CONVENTIONALITY ON THE RELATIONSHIP  
BETWEEN GENDER AND VOCATIONAL INTERESTS

by  
OMER IHSAN AWAD

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Approved by:



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Dr. Pia Zeinoun, Assistant Professor  
Department of Psychology

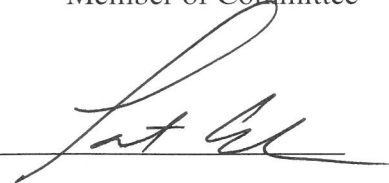
Advisor



---

Dr. Charles Harb, Professor  
Department of Psychology

Member of Committee



---

Dr. Tima Al-Jamil, Assistant Professor  
Department of Psychology

Member of Committee

Date of thesis defense: August 20, 2019

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# AN ABSTRACT OF THE THESIS OF

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Title: The Moderating Role of Openness and (Un)Conventionality on the Relationship  
Between Gender and Vocational Interests

*Background:* Vocational interests which can be categorized into six inter-related categories show large gender differences. The current study explores the personality traits of individuals who deviate from stereotypical gender patterns. We focused on two personality traits, Openness and (Un)conventionality, which we hypothesized will interact with gender to predict whether an individual follows or deviates from a gender stereotypical vocational interest. *Aims:* This study aimed to examine whether specific personality traits, namely Openness and (Un)conventionality, will moderate the direct relationship between gender and vocational interests. *Methods:* We administered an online survey to a convenience sample of college students ( $N= 197$ ) to measure personality and vocational interests using psychometrically robust tools. *Results:* We found partial support for all hypotheses. Males reported to be progressive, secular and unbound by tradition (i.e. higher on the trait of (Un)conventionality) were more likely than traditional males, to report being interested in Social vocations which are typically female-dominated. Conversely, females reporting high (Un)conventionality, were more likely than those who were traditional, to deviate from gender-typical vocational interests and report little interest in female-dominated Social vocations. We also found significant main effects between gender and vocational interests, and between gender and college major, so that men were much more likely than women to be enrolled in a STEM rather than non-STEM major, and men reported much more interest than women, in Investigative and Realistic interests. *Discussion:* These findings highlight the need to examine the role of adherence to tradition and being unconventional in explaining gender differences found in vocational interests. They also highlight the need for more studies that explain and propose interventions to increase the likelihood of women enrolling in STEM majors.

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The Moderating Role of Openness and (Un)Conventionality on the Relationship Between  
Gender and Vocational Interests

### **Vocational Interests**

Vocational interests are a person's dispositions associated with preferences for activities and actions (Low, Yoon, Roberts, & Rounds, 2005). The field of vocational interests has been driven by the work of three major scholars – Strong (1943), Kuder (1939), and Holland (1959), all of whom centered their work on the development of inventories to measure vocational interests. This has resulted in a vast field of literature that focuses on models that are psychometrically-derived, rather than theoretical. The most prominent of these models has been Holland's RIASEC model of vocational interests (1997), which has been used to organize findings, including gender differences, in vocational interests.

#### **Holland's RIASEC Model**

Holland's theory posits that people's interests, fall into six adjacent categories - Realistic, Investigative, Artistic, Social, Enterprising, and Conventional (RIASEC; Holland, 1997), and these categories of vocational interests can also apply to occupational environments (Holland, 1997) and academic disciplines (Woods & Hampson, 2010). Through assessments, people can know which "code", or combination of letters, best describes their interests, and seek congruent careers.

Realistic (R) interests and environments are those that deal with concrete, practical and systematic tasks. In these environments, machines and tools are frequently used. Examples of Realistic academic disciplines are electrical engineering and mechanical engineering (Gasser, Larson, & Borgen, 2007). Investigative (I) interests and environments are those that deal with the application and acquisition of knowledge through investigation and problem solving. Examples of Investigative academic disciplines are biology, mathematics, sociology, economics,

and civil engineering. Artistic (A) interests and environments are those that deal with creative activities and focus on abstract and unsystematic tasks. These environments value innovative and creative skills. Examples of Artistic academic disciplines are arts, English, architecture, music, and theater. Social (S) interests and environments are those that deal with helping and teaching others. The focus in these environments is on acquisition and application of interpersonal skills. Examples of Social academic disciplines are political science, nursing, special education, philosophy and history. Enterprising (E) interests and environments are those that deal with personal or organizational goal achievement through leadership and assertiveness. These environments value leadership development, popularity, self-confidence and aggressiveness. Examples of Enterprising academic disciplines are business, and journalism. Finally, Conventional (C) interests and environments are those that deal with systematic manipulation of data, such filing records, calculating numbers. Examples of Conventional academic disciplines include accounting, taxation, and agricultural business technology.

The model structures the 6 types adjacently in a hexagon form (R-I-A-S-E-C), so that the types closest to each other are most similar and often are used together to describe a person or job (e.g., S and A), while those that are diametrically opposite are the most dissimilar (R and S). For example, the occupation of “psychologist” is defined as being closest to the Investigative, Social and Artistic interest categories, and therefore defined with the code ISA (O\*NET, 2018).

The RIASEC model has been extensively studied in the past five decades (for a historical review see Nauta, 2010). The vast literature that supports it has led to its adoption by the U.S Department of Labor and the O\*NET database, which have categorized jobs according to their RIASEC codes and made them available for job-seekers on their website <https://www.onetonline.org/>. Some of the most consistent findings are that the RIASEC predicts jobs and college majors (Hansen & Dik 2005; Porter & Umbach, 2006; Tracey & Hopkins,

2001), along with job opportunities, salary potential, (Malgwi, Howe, & Burnaby, 2005), parental influences (Fan, Cheung, Leong, & Cheung, 2012) and other factors. It is also generally applicable across different groups and cultures (Sverko, 2007; Tracey, Watanbe, and Schenider, 1997; Tang, 2009). Most relevant to this study, is that the RIASEC interests show clear differences between men and women. These gender differences are reviewed in detail, in the section below.

### **Gender and Interests**

Gender<sup>1</sup>, one's reported attribution of being male or female, has a significant main effect on occupational membership, college major, and RIASEC vocational interests (Porter & Umbach, 2006). For instance, there is consistent evidence that women are under-represented in the academic and occupational fields of science, technology, engineering, and mathematics, despite social and economic developments (Diekman, Steinberg, Brown, Belanger, & Clark, 2017; Van Tuijl, & Walma van der Molen, 2015). In Lebanon, a similar pattern is found. In terms of college majors, women make up a staggering 91% of students in education majors, 69% of health and welfare majors and 61% of humanities and arts majors (Yaacoub & Badre, 2012). These findings demonstrate that there is a main effect between gender and declared major, so that the majority of men and women in our sample will likely have "gender-typical" majors.

Such data begs the question as to *why* the majority of men and women follow gender-typical paths, and what makes some unyielding to this pattern. To answer this question, we first explain how vocational interests show powerful gender differences across cultures and methods. Then, we argue that those who do not conform to these gender-typical patterns, differ from those that do, on basic personality dispositions of Openness and (Un)conventionality.

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<sup>1</sup> Although gender is defined in the current study as males or female, gender is a fluid concept (American Psychological Association, 2015). We decided to use the binary definition of gender because there is insufficient research on vocational interests and fluid gender categorizations.

### **Gender Differences in Interests Across Cultures**

There is substantial evidence that men and women differ in their fundamental vocational interests (*See figure 1*). Studies and large meta-analyses have shown that the vocational interests based on the RIASEC are divided across gender lines (Lippa, 1998, 2010; Su et al., 2009).

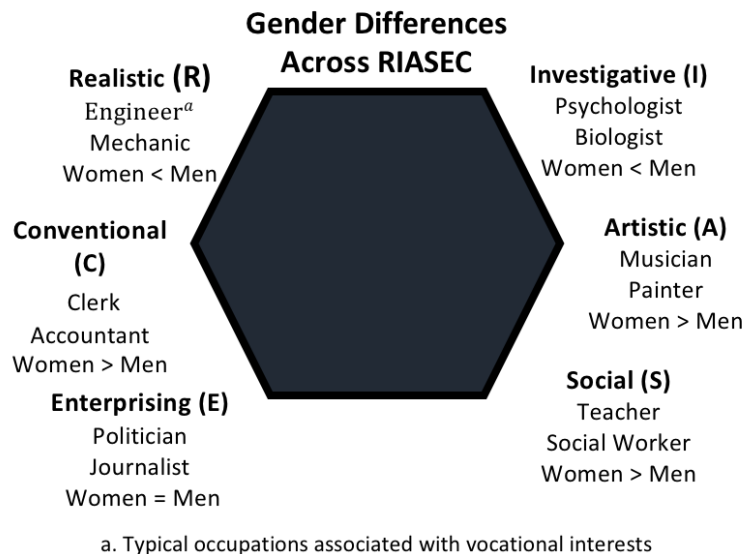
A recent meta-analysis of studies with over half a million participants who completed various vocational interest inventories that measure the RIASEC dimensions, showed that men were more interested in Realistic ( $d = .84$ ) and Investigative ( $d = .26$ ) occupations while women were more interested in Social ( $d = .68$ ), Artistic ( $d = .35$ ), and Conventional ( $d = .33$ ) occupations. No gender differences were found in the Enterprising dimension of the RIASEC model (Su et al., 2009). Lippa (1998) also assessed gender differences in a sample of 2,361 participants from an American university across the people-things dimension, and found an even larger effect size ( $d = 1.32$ ). Lippa's effect size has been called the "largest sex difference in the field of individual differences" (Su et al. 2009, p. 860). One possible reason for the difference between the two effect sizes could be that Su et al.'s (2009) study included several RIASEC inventories that actively attempted to decrease gender differences (Su et al., 2009) while no such measure was taken in Lippa's study.

Another way to understand gender differences in RIASEC interests is to collapse the categories of the model into two dimensions - a people-things dimension, and a data-ideas dimension (Prediger, 1982). Interests that are Social and to a lesser extent Artistic, are on the "people" side of the continuum, while Realistic types, are on the "things" end of the dimension. The people-things dichotomy provides a useful framework to examine gender differences as it allows a focused look into the two main interests that men and women differ on. Using this dichotomy, Su et al. (2009) reported that in a sample of over 500,000 people, there was a large

gender effect ( $d=.93$ ), whereby men were interested in things and women were interested in people.

To examine whether these gender differences exist cross-culturally, Lippa (2010) used the people-things dimension to assess interests across 53 nations with over 200,000 participants. The results indicated a very large and consistent gender difference. Again, men more than women, preferred occupations that require working with things while women more than men preferred occupations that require working with people across the 53 nations ( $d=1.40$ ). This effect is almost equivalent in magnitude to the effect size of height differences between men and women ( $d=1.63$ ) confirming that gender differences in vocational interests are clearly present (Lippa, 2010).

*Figure 1*



**Etiologies of gender differences in RIASEC.** Multiple conceptualizations exist to explain why vocational interests are divided across gender lines. Although a thorough review of etiology is beyond the scope of this paper, it is relevant to emphasize the most prominent

explanations of socialization and evolutionary perspectives, and how they relate to our argument that individual dispositions moderate the effect of gender on college major and interests.

Social role theory (SRT; Eagly, Wood, Diekmann, Eckes, & Trautner, 2000; Wood & Eagly, 2002), and gender socialization theories (Ruble, Martin, & Berenbaum, 1998), are theories that share in common their emphasis on social, environmental, and cultural factors to explain sex differences in vocational interests. SRT states that psychological sex differences are the result of gender roles that are prevalent across societies (Eagly et al., 2000). For example, parents encourage boys and girls to engage in gender typical play, where they are more likely to give non-domestic chores to boys, and assign domestic chores to girls (Bussey & Bandura, 1999). Gottfredson (1981) argued that through sex-role typing, gender influences the development of vocational aspirations at around age 6-8 years, predating any other individual factor, including personality traits.

However, socialization theories have difficulty explaining why boys and girls continue to show gender-typical vocational interests, even in social contexts that do *not* emphasize conventional gender roles. For example, gender differences in clerical (Conventional) and scientific (Realistic and Investigative) interests were higher in gender egalitarian societies compared to less gender egalitarian societies (Ott-Holland, Ryan, Huang, & Wadlington, 2013). Charles and Bradley (2009) examined gender differences of working in science, technology, engineering, and mathematics and found the larger differences in gender egalitarian nations compared to less gender egalitarian nations. This has been called the gender equality paradox and one explanation for it is that individuals in countries with high gender equality are more likely to choose occupations and majors that are in line with their academic strengths compared to those with lower gender equality (Stoet & Geary, 2018). As aforementioned, Lippa's (2010) study across 53 nations found men to be interested in occupations that require working with



things and women to be interested in working with people, and this difference was consistent whether in Norway, which has a high degree of gender equality or Saudi Arabia that has low gender equality.

In contrast to socialization theory, evolutionary explanations state that natural selection differentially impacts male and female reproductive fitness and behaviors. Men and women, on average, may differ on interests, because the interests that led to high reproductive fitness of women were different than those for men (Buss, 1999). For example, high levels of aggressiveness and risk-taking would increase male dominance and help males find mates more easily, while for females high levels of empathy and ability to provide high emotional and physical care would help them attract mates (Lippa, 2010). Therefore, given that the aspects that led to the survival of men and women were different, evolutionary theory would assume that women being more interested in “people” while men are more interested in “technical” aspects held a reproductive advantage over time. The studies reviewed on *universal* cross-cultural gender differences in interests (e.g., Lippa, 2010), support the notion that gender-typical interests may be biologically rooted, and therefore present across cultures, regardless of social norms.

Pinpointing the origin of sex-differences is likely to remain a heated topic within psychology, and is beyond the scope of this project. However, what both theories focus on are mean differences between sexes and between countries, and they fail to account for individual differences. Cross-cultural studies do not explain the individual-level variations within a culture. That is, despite strong evidence that men and women, on average, have gender-typical vocational interests across cultures, there are some individuals within those cultures that do *not* show this trend. Across cultures, there are some men who are interested in being nurses, and some women who are interested in flying commercial planes. Along the same line of reasoning, socialization

theory does not explain why an individual, despite gender-conforming upbringing and socialization, will eventually pursue gender non-conforming interests.

A possible explanation of why individuals do not conform to the pattern of gender differences is that their individual personality dispositions may moderate the relationship between gender and interests. This leads to the aim of the proposed study which is to examine whether specific personality traits – namely Openness and (Un)conventionality will interact with gender, to produce a variation in vocational interests.

### **Personality**

Personality is loosely defined as the relatively stable ways of thinking, feeling and behaving (Caspi, Roberts, Pervin, & John, 1990). A prolific field in psychology, personality traits have been studied as main predictors of important behaviors and life outcomes such as first-semester adjustment to college (Lidy & Kahn, 2006), subjective well-being (DeNeve & Cooper, 1998), and other important life outcomes (for a review see Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007). Also, broadly speaking, personality factors show small to moderate gender differences with the largest discrepancy being that females score higher on Neuroticism, and Agreeableness, and lower on Extraversion than males (Laher, Zeinoun, & Cheung, in press).

What is more interesting is that personality traits interact with a number of variables (i.e. act as moderators) to differentially predict important outcomes for men and women. For example, emotional stability predicts academic performance more so in males than females (Nguyen, Allen, & Fracastoro, 2005). Relevant to this study, is the investigation of personality traits, and their interaction with gender, in predicting vocational interests (Woods & Hampson, 2010). In the section below, we first describe how personality traits are classified, paying particular emphasis on local (Arab) classifications of traits, and we then elaborate on studies that

link personality traits to vocational interests, with a focus on the Openness/Intellect factor and its Arab variant called (Un)conventionality.

### **Trait Models of Personality**

The basic components of human personality have been summarized in a number of dimensions, including one (Musek, 2007), two (Saucier, Thalmayer, & Bel-Bahar, 2014), three (Barrett, Petrides, Eysenck, & Eysenck, 1998; De Raad et al., 2010), five (Goldberg, 1990), six (Lee & Ashton, 2008), and even 16 (Cattell & Mead, 2008) personality dimensions. However, models that include *five* factors of personality, such as the lexical Big Five (Goldberg, 1990) and the Five Factor Model (Costa & McCrae, 1992) are found to be most replicable across cultures, and have been extensively studied as predictors of behavior. These five factors are *Extraversion* (sociable, active, energetic), *Agreeableness* (cooperative, considerate, trusting), *Conscientiousness* (dependable, organized, persistent), *Emotional Stability* (calm, secure, regulated), and *Openness/Intellect* (open-minded, cultured, imaginative) (Goldberg, 1990).

The FFM has been used extensively in the literature, and to a large extent has shown cross-cultural invariance (Allik & McCrae, 2004; McCrae & Terracciano, 2005). However, cross-cultural approaches to psychology argue that even if a personality model shows universal applicability, there continue to be culture-specific aspects of personality that are important to understand and measure (Benet-Martínez, 2007). Using this rationale, Zeinoun et al. (2017), developed a personality model that is derived from the Arab Levant region.

Using a combination of qualitative and quantitative methodologies (Zeinoun et al., 2017) found that 7-factors are needed to subsume the personality traits deemed important by participants in Lebanon, Syria, Jordan and Palestine. Their model covers the Big Five dimensions of *Extraversion*, *Agreeableness*, *Conscientiousness*, *Emotional Stability*, and *Intellect*, but adds two culturally-relevant factors named *(Un)conventionality* (the extent to which

one is tradition-bound versus progressive), and *Honesty/Humility* (*the extent to which one is greedy, trustworthy, and has integrity*). Of particular interest to this study is the factor of (Un)conventionality because it is positioned by the authors as a local variant of the *Openness* factor. In this paper, we pay particular attention to the factor of Openness/Intellect and how it relates to gender-conforming vocational interests. Therefore, a background on this factor, and its local variant, is warranted.

**Openness/Intellect.** Also known as Factor V, no other personality factor is debated as much as the fifth trait of the Big Five (DeYoung, 2014). The awkward compound name of the trait reflects differences between personality psychologists and the methodologies used to derive this factor (For a review, the reader is referred to McCrae, 1994). In sum, depending on the methodology used to derive the personality factors, some studies refer to this personality factor as *Intellect* to describe someone who is cultured, and imaginative (Goldberg, 1990), while others prefer to call it *Openness to Experience* (Costa & McCrae, 1985) to refer to one's tendency to be intellectually curious, imaginative, seek variety, explore inner feelings, have strong aesthetic sensibilities, and hold unconventional values (McCrae & Costa, 1982, 1983).

Several studies associate Openness with variables such as traditionalism and conservatism (Carney, Jost, Gosling, & Potter, 2008; DeYoung et al., 2007; Goldberg & Rosolack, 1994; Hirsh, DeYoung, Xu, & Peterson, 2010). McCrae and Costa (1997), in their conception of the FFM, emphasized Openness' negative relation to conservatism, and close-mindedness. The implications follow that people who are low on Openness would not appreciate alternative perspectives, and belief systems, and instead hold on to traditional perspectives such as for example, traditional gender roles.

**(Un)conventionality.** In the Arab-Levant, a psycholexical study that broadly followed the methodologies used to develop the Big Five, yielded neither Openness nor an Intellect factor

(Zeinoun, Daouk-Öyry, Choueiri, & Van de Vijver, 2017). However, the lack of replication was attributed to methodological issues when the psycholexical method is indiscriminately applied to the Arabic written language (Daouk-Öyry, Zeinoun, Choueiri, & Van de Vijver, 2016). In follow-up studies that used alternative methodologies and combined qualitative and quantitative approaches, Intellect emerged as a clear stand-alone factor, and a culturally-specific variant of Openness also emerged (Zeinoun, Daouk-Öyry, Choueiri, & Van de Vijver, 2017). Openness still did not emerge like it did in other Big Five studies, instead the authors found a new factor which resembles Openness but revolved around being traditional and adhering to convention. Named *(Un)conventionality*, this factor encompassed concepts such as being traditional and adhering to convention, versus being secular, holding progressive values, and not being bound by convention. Although (Un)conventionality is still an understudied factor, Zeinoun et al. (2017) framed this factor as going above and beyond Openness and Openness/Intellect. They found a weak relationship with Intellect/Openness from the Big Five ( $r = .20$ ).

All in all, both Openness and (Un)conventionality include a disposition of going against the norm, and we hypothesize that they will moderate the extent to which one's reported gender predicts their vocational interest. Including both factors allows us to maintain comparability with previous studies that have used the Big Five or FFM, while at the same time remaining relevant to the local culture.

### **Personality, Vocational Interests, and Gender**

The reviewed personality models, with the exception of the new Arab model, have been extensively studied against vocational interests, with consistent evidence that there is a small to moderate *main* effect between personality and vocational interests, and that this relationship exists across methodologies, and gender (De Fruyt & Mervielde, 1997; Judge, Higgins, Thoresen, & Barrick, 1999; Larson, Rottinghaus, & Borgen, 2002). What remains to be better

understood is whether personality also moderates the relationship between gender and vocational interests.

### **Openness as a Moderator of Gender Differences**

To our knowledge, there is one relevant study that investigates whether Openness acts as a moderator between gender and gender-stereotypical interests. The study investigates whether gender moderates the relationship between Openness and interests as categorized by occupations.

Woods and Hampson (2010) assessed associations of the Big Five personality traits in childhood with adult occupations and categorized occupations according to the RIASEC model. Specifically, they tested whether gender moderated the associations between personality measured in childhood, and gender stereotypical adult occupations in adulthood. Realistic occupations were categorized as male-stereotyped while Conventional environments were female stereotyped. As predicted, for women, but not for men, low score on childhood Openness/Intellect was associated with Conventional occupations ( $B = .01$ ), while low Openness/Intellect was associated with higher frequency of Realistic occupations for men ( $B = -.12$ ), but not for women. This indicates that those with low Openness/Intellect were more likely to work in gender stereotypical occupations (Woods & Hampson, 2010). Children high on Openness/Intellect regardless of gender did not differ in their adult occupations on Investigative and Artistic interests. More imaginative and curious girls and boys were both equally likely to work in Investigative and Artistic occupations.

One of the limitations of the Woods and Hampson study (2010) is that they did not examine the association of Openness/Intellect with actual vocational interests but with adult occupations categorized by the authors according to the RIASEC vocational interest model. This is a limitation because, as mentioned earlier in the paper, an individual's *actual* job choice is not decided by vocational interest only but by other factors such as pay, location, and the economy

(Furhnam & Koritsas, 1990). In contrast, interests can be reported relatively free of such constraints on an anonymous questionnaire which we use in this study. Furthermore, another limitation of the Woods and Hampson (2010) study is that the authors based their personality assessment on observer data instead of self-reports. This study will use direct self-reports for all variables.

### **The Present Study**

The aim of the proposed study is to examine whether specific personality traits, namely Openness and (Un)conventionality, will moderate the direct relationship between gender and vocational interests.

Literature in vocational interests has consistently shown clear gender differences in vocational interests (Lippa, 1998, 2010; Su et al., 2009). Gender typical interests are defined as Realistic and Investigative for men and Social, Conventional, and Artistic for women based on studies of gender differences in vocational interests (Su et al., 2009). The current paper attempts to understand how specific personality traits alter the relationship between gender and vocational interests. One important personality trait that may influence the relationship is Openness and its cultural variant called (Un)conventionality. Openness is negatively related to traditionalism and holding on to norms (DeYoung et al., 2007), while (Un)conventionality encompasses non-traditional attitudes among Arab-Levant samples (Zeinoun et al., 2017). The correlation between Openness and Unconventionality is only .20 indicating that the two variables assess different aspects of going against traditions and norms (Zeinoun et al., 2017). Therefore, it is important to include both variables in the current study. Individuals who score low on Openness and (Un)conventionality are expected to hold more traditional views than those high on Openness and (Un)conventionality leading them to be more likely to develop gender typical interests.

### Hypotheses

1. There will be a main effect between gender and vocational interests, so females will more likely have interests in Artistic, Conventional and Social interests, and males will show more interest in Realistic and Investigative interests.
  
2. (Un)conventionality or Openness will have a moderating effect on the relationship between gender and interests, so that participants with low scores on (Un)conventionality or Openness will be more likely to have gender typical interests.

### Methods

#### Sample Calculation

To find the sample size required to reject the null hypothesis we applied a method that uses several parameters, including effect size, and power, and produces a recommended sample size using the software G-Power (Faul & Erdfelder, 1992). We calculated the expected effect size, by extracting the average effect sizes found in a similar study by Woods and Hampson (2002). We set alpha at 0.05. Using an average expected effect size of 0.23 (for main effect) and .05 (for interaction), the recommended sample size was 110, and 481, respectively.

#### Participants

We recruited a convenience sample ( $N = 197$ ) of students enrolled in an introductory psychology class at the American University of Beirut. The sample was predominately female (72%), with an age range between 18 and 24 ( $M = 18.57$ ,  $SD = 1.16$ ), with most of the sample (72%) in their sophomore year.

*Table 1*  
*Demographic Variables*

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	$N = 195$	%	Mean	SD
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			18.57	1.09
Age				
18 years	130	66.7	-	-
19 years	44	22.3	-	-
20 years	8	4.1	-	-
21 years	8	4.1	-	-
22 years	1	.5	-	-
23 years	1	.5	-	-
24 years	3	1.5	-	-
Education				
Freshman	19	9.6	-	-
Sophomore	142	72.1	-	-
Junior	23	11.7	-	-
Senior	12	6.1	-	-
Gender				
Male	54	27.4	-	-
Female	143	72.6	-	-
Family Income in USD				
Less than 20,000	65	33.0	-	-
20,000-39,999	29	14.7	-	-
35,000-49,999	24	12.2	-	-
50,000-74,999	31	15.7	-	-
75,000-99,999	7	3.6	-	-
100,000	24	12.2	-	-
Missing	17	8.6		

### Instruments

**Demographic variables.** Participants were asked questions about age, gender, declared major and minor, year at university, family income bracket, and parental education and occupation.

**O\*NET Interest Profiler (IP) Short Form.** The Interest Profiler (Rounds, Su, Lewis, & Rivkin, 2010) measures six types of Holland's (1997) vocational interests: Realistic (R), Investigative (I), Artistic (A), Social (S), Enterprising (E), and Conventional (C), collectively called RIASEC. The Short Form of the Interest Profiler (IP), has 60 items with 10 items per RIASEC scale. Participants are instructed to read the statements pertaining to interests, such as “*Do you like building kitchen cabinets*” and respond on a scale with three choices: “Like”, “Dislike” and “Unsure”. Participants are instructed *not* to think about their abilities or possible

monetary incentives from that activity. To score the IP, the number of “likes” are added to produce a score, whereby the higher the score, the more interested the participant is in that specific dimension.

***Reliability and validity in non-Middle Eastern samples.*** Psychometric properties of the IP Short Form are acceptable. The internal consistency of the short form on a sample of 1,061 participants ranged from .78 to .87 ( $M = .81$ ) (Rounds et al., 2010). In another sample, ( $N = 32$ ), the test- retest correlations, ranged from .78 (Investigative) to 0.86 (Social and Conventional), suggesting stability of scores across time (Rounds et al., 2010).

The IP also shows evidence of structural validity of the RIASEC model whereby the correlations decreased as one scale moved away from the other and then increased as the scale again moved closer along the hypothesized circular structure (Rounds et al., 2010). The circular relationship between the RIASEC scales measured through the IP-short form, corresponds well ( $r = .69$ ) with the hypothesized hexagonal structure of the RIASEC (Rounds et al., 2010). Rounds et al. (2010) conclude that the IP- short form fits Holland’s model as well and in some cases better than other RIASEC measures such as the Interest Profiler Long Form.

Evidence for the convergent and discriminant validity of the short form is also acceptable. RIASEC scores on each of the scales of the short-form positively and significantly correlated with their respective scales on a similar test called the Interest Finder (Rounds et al., 2010; Wall & Baker, 1997). Also, cross-correlations of corresponding scales between the short form and the Interest Finder ranged from .74 (Social) to .82 (Conventional) (Rounds et al., 2010). The discriminant validity of the short form was also supported as correlations between conceptually dissimilar scales with the Interest Finder ranged from .11 (Social and Realistic) to .50 (Enterprising and Conventional). Correlations with the Interest Finder, ranged from .12

(Social and Realistic) to .48 (Enterprising and Social) again providing evidence for the discriminant validity of the short form.

**Reliability and validity in current sample.** In our sample, internal reliability of the IP scales was very good, ranging from .88 for the Artistic scale to .76 for the Social scale. We also explored the structural validity of the IP, by examining the correlations between scales and whether they conform to their hypothetical relationships. We did this using Pearson's  $r$  as confirmatory factor analysis of the RIASEC scale was beyond the scope of this thesis.

According to Holland's (1992) hexagon model, interests opposite to each other should correlate least with each other, while adjacent interests correlate most to each other. Correlations between interests of the current sample showed that pattern and thus give partial support for the structural validity of the IP in the current study (Table 2). For example, according to Holland's model interests that are opposite of each other on the hexagon should have the lowest correlations which is portrayed by the weak relationship between the Realistic and Social interests (.24). Interests close to each other on the hexagon such as Social and Artistic interests are expected to have strong correlations and indeed Social interests were most correlated with Artistic interests (.44)

*Table 2*  
Correlations Between RIASEC Scales

	1	2	3	4	5	6
1. Realistic	1					
2. Investigative	.40*	1				
3. Artistic	.25*	.14	1			
4. Social	.24*	.13	.44*	1		
5. Enterprising	.34*	.11	.36*	.39*	1	
6. Conventional	.68*	.38*	.20*	.25*	.51*	1

\*Correlation is significant at the 0.05 level (2-tailed)

**Arab Personality Inventory (API).** The API is a personality measure consisting of 70 items rated on a five-point Likert scale ranging from 0 (*strongly disagree*) to 5 (*strongly agree*). It is based on an initial pool of 314 items which were constructed to cover the content of

personality dimensions deemed to be culturally relevant to the Arab region. To test initial evidence of their validity in measuring personality, the authors tested the 314 items on a sample of Lebanese, Jordanians, and Palestinians ( $N = 395$ ), along with items that measure the lexical Big Five (Goldberg, 1999). Results of principal component analyses revealed a 7-factor structure that encompassed the lexical Big Five (*Extraversion, Agreeableness, Conscientiousness, Emotional Stability, and Intellect*), in addition to a factor that was a variant of Openness (named Un-conventionality), and a factor named Honesty/Integrity that resembles its counterpart in the HEXACO personality model (Lee & Ashton, 2008). Correlations between the indigenous API factors and the lexical big five factors, suggested that there was an important overlap between the factors of Emotional stability (.79), Agreeableness (.60), Conscientiousness (.62) and Extraversion (.65). However, the factor of (Un)conventionality went above and beyond the lexical big five, with only small correlations with its counterpart Intellect/Openness (.20), and a differential relationship with known demographics variables such as age, education, and language proficiency.

Based on this work, Daouk-Oyry, Zeinoun, Sahakian, Van De Vijver (in progress), created, and developed a briefer, 70-item API to which they administered to a sample of 3359 participants across 7 Arab countries, including Lebanon. The seven-factor model was replicated. The API-70 is scored by adding ratings for each factor, with reverse scoring when appropriate. For (Un)conventionality, the higher the score the more the participant reports being secular, progressive, and non-traditional.

***Reliability and validity in current sample.*** Alpha coefficients of the original subscales ranged from .68 (Agreeableness) to .81 (Extraversion and Emotional Stability). Of particular interest for the current study is the (Un)conventionality factor which had an adequate alpha

coefficient of .73 when using the 10 original items. A Principal Component Analysis<sup>2</sup> using the original parameters by Zeinoun et al. (2017) showed that 7/10 of the original (Un)conventionality items loaded as expected. Despite this, we used all 10 of the original items to remain theory/model driven, instead of data driven. Please refer to appendix B to view the results of the PCA.

**The International Personality Item Pool - (IPIP).** The IPIP is an open-source pool of items that can be combined to form personality scales that measure the Big Five or FFM and other aspects of personality (Goldberg, 1992; [www.ipip.ori.org](http://www.ipip.ori.org)). The IPIP-50 uses brief items, simple language and has been translated to multiple languages (Goldberg, 2015).

The items are all measured on a five-point Likert scale ranging from 0 (*very inaccurate*) to 5 (*very accurate*) and ask participants how accurately statements describe them. For the purposes of this study, we selected 50 items (10 items per factor) that measure Agreeableness, Extraversion, Emotional Stability, Conscientiousness, and Openness to Experience as conceptualized in the FFM (Costa & McCrae, 1992).

***Reliability and validity in non-Middle Eastern samples.*** Evidence for the psychometric properties of the IPIP scales are well documented ([www.ipip.ori.org](http://www.ipip.ori.org)). In terms of reliability, the scales show good internal consistency with coefficients ranging from .77 to .86 ( $M = .82$ ) (Goldberg, 2015). Also, the test-retest correlations, range from .73 (Agreeableness) to .86 (Extraversion), suggesting stability of scores across a two-month period (Gnambs, 2015). In terms of validity evidence, the IPIP items chosen for this study, show high convergence with

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<sup>2</sup> To examine the structural validity of the API-70, we used PCA to force 7 factors, using Oblimin rotation, as per previous research (Zeinoun et al., 2017). Tabachnick and Fidell (2013) recommend a sample size of at least 300 cases to ensure that the correlations are reliably estimated. Although the current sample size was below the recommended, tests of sample size adequacy were met. The Kaiser-Meyer-Olkin measure of sampling adequacy was .76 indicating that the data is suitable for factor analysis (a minimum of .60 is recommended). Also, Bartlett's test of sphericity was significant  $\chi^2(2415) = 6328, p < .05$  indicating that the variables are sufficiently correlated and that factor analysis can be conducted.

corresponding dimensions on the NEO-PI-R ranging from  $r=.88$  to  $.92$  ( $M=.90$ ) (Goldberg, 2015).

*Reliability and validity in current sample.* Alpha coefficients on the IPIP subscales ranged from  $.64$  (Agreeableness) to  $.83$  (Neuroticism). Openness had a good alpha coefficient of  $.77$ . We conducted PCA with Varimax rotation, forcing 5 factors<sup>3</sup> as per previous research (Goldberg, 2015). Although our factors were correlated above  $.3$ , which suggests conducting an Oblimin rotation, it is beyond the scope of this study to investigate data-driven factor structures. Additionally, Goldberg (1990) argues that results do not significantly change depending on the method used. Therefore, in the current analysis we followed previous research and used varimax rotation. All five dimensions were revealed, but 6 out of 50 items did not load on expected factors. With regard to Openness, 8/10 items loaded as expected. Despite this, we used all 10 of the original items to remain theory/model driven. Please refer to appendix C to view the results of the PCA.

## Procedure

Following IRB approval of this study, the instruments were placed online using limesurvey. To control for order effects, the scales were randomized, with the exception of the demographics questions which remained at the beginning of the questionnaire. To recruit participants, the participant-pool coordinator advertised the study via email to students from the undergraduate psychology student pool, i.e. Psyc 201 inviting them to participate in exchange for one class credit. Once students accessed the link, they were provided with an explanation of the study, and of their rights as volunteer research participants. Participants were required to click

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<sup>3</sup> Tabachnick and Fidell (2013) recommend a sample size of at least 300 cases to ensure that the correlations are reliably estimated. Although the current sample size was below the recommended, tests of sample size adequacy were met. The Kaiser-Meyer-Olkin measure of sampling adequacy was  $.76$ , while Bartlett's test of sphericity was significant  $\chi^2(300) = 1270, p < .05$  indicating that the data was suitable for factor analysis.

“Agree”, to demonstrate informed consent to participate. Upon completion, students received a thank you message and a unique code to earn their extra credit point for their class.

## Results

### Statistical Analysis

Data was analyzed using SPSS v23. First, we conducted preliminary analysis for missing values, and computed relevant variables. Second, we conducted exploratory factor analysis and reliability analyses for the measurement tools (results described under *Instruments*). Third, we ran descriptive analyses of the sample’s demographics, personality traits, and vocational interests, and checked for basic assumptions of multiple regression.

To test our main hypothesis, we conducted 12 moderated multiple regressions - six regressions with each of the RIASEC variables as outcomes, to examine the moderating role of (Un)conventionality and six regressions to examine the moderating role of Openness.

We also ran various other analyses to better understand our data and sample. To test for gender differences in personality, and in vocational interests, we ran independent samples t-tests. To examine the relationship between gender and reported college major we used two methods - a binary logistic regression that examines the effects of all predictors (personality and gender) on college major, and a chi square analysis, which only examines the independence between gender and college major.

### Preliminary Analyses

**Missing values.** Since gender is one of the study’s main variables, we deleted 65 cases that did not include gender information. Furthermore, participants that were missing over 25% of questions on the main scales (API, IPIP, or IP) were also eliminated. In total, 89 cases were removed, and the resulting sample consisted of 197 participants.

Missing ratings from the scales were imputed using *Estimation Maximization* (EM), after meeting the assumption of EM that data is missing at random. In total, 150 data points were imputed on the main scales (IPIP, API, and O\*NET). The missing scale values were missing completely at random (MCAR) and Little's MCAR test was not significant, for the IPIP:  $\chi^2(N = 197) = 1162.65, p = .12$ , API:  $\chi^2(N = 197) = 1852.16, p = .12$ , and the Interest Profiler:  $\chi^2(N = 197) = 1700.84, p = .10$ .

Data quality checks were conducted by producing frequency tables, and descriptives for all variables, and examining that all values fell within appropriate ranges.

### **Statistical Assumptions of Multiple Regression.**

***Multicollinearity.*** To check for multicollinearity, two methods were utilized: checking the correlation matrix among predictors, and the Variance Inflation Factor (VIF) values. All correlations between IVs were below .8, and all VIF values were below 10. Therefore, the assumption of multicollinearity was met. Variables that were predicted to have problematically high multicollinearity because of the inclusion of interaction terms (i.e., Openness, (Un)conventionality) were centered as per the recommendation of Aiken and West (1991).

***Normality of residuals.*** To test the assumption of normality of residuals of the outcomes (Interest Profile scores), the respective histogram was examined. Upon observation, the distribution was similar to the normal bell-shaped curve for all six interests. Therefore, this assumption was met.

***Homoscedasticity of regression slope.*** The scatterplot of the standardized residuals (ZPRED vs. ZRESID) was examined to test the assumption of homoscedasticity. The assumption was met as the residuals were scattered evenly across all scores.

***Independence of errors.*** All outcome variables (Realistic, Investigative, Artistic, Conventional, Enterprising, Social) had Durbin-Watson values close to 2. Of particular interest



is the Social interest variable (because it produced a significant interaction effect), which had a Durbin-Watson of 1.81.

**Outliers.** Calculation of Mahalanobis distance revealed that only two cases were below the recommended .001 level (Tabachnik and Fidel, 2012). The cases were not removed because outliers and deviations from the norm are an important part of the current study.

### **Computation of Variables**

**College major.** To turn college majors into meaningful and manageable categories, we collapsed all majors into STEM or non-STEM majors. To do this, we followed the procedures outlined by Koonce, Zhou, Anderson, Hening, and Conley (2011) whereby all majors of natural sciences (biology, chemistry, physics), computer science, mathematics, and engineering were considered STEM, while majors such as psychology, nursing, and education were considered non-STEM. Other majors in our data, such as medical imaging, and nutrition, were not categorized by Koonce et al. (2011) or others. For such contested majors, we decided to subjectively categorize them into STEM or non-STEM depending on the degree to which they include STEM-like classes. For example, medical imaging is mostly comprised of biology and lab work, therefore it was categorized as STEM.

### **Descriptives and Group Differences**

#### ***Personality: Openness and (Un)conventionality***

The following section will report the central tendencies for the scales of the IPIP, and API (Table 5). On the IPIP, the sample scored highest on the trait of Openness ( $M = 36.11$ ,  $SD = 6.10$ ), and lowest on the trait of Neuroticism ( $M = 29.12$ ,  $SD = 6.85$ ). On the API, the sample scored highest on Agreeableness ( $M = 39.47$ ,  $SD = 4.26$ ) and lowest on (Un)conventionality ( $M = 25.56$ ,  $SD = 5.76$ ).

In terms of (Un)conventionality on the API, participants' mean scores were lower than those of Openness ( $M=26.00$ ,  $SD= 5.76$ ), and were positively skewed more than  $\pm 3.29$  ( $Z$ -skewness= 4.35). An examination of the raw data showed several cases of extreme responding. However, the remaining data of those cases were not extreme, therefore it was judged that the skewness may represent a true variation of rather strong endorsement of (Un)conventionality. It is noteworthy that average scores of (Un)conventionality in this sample, were relatively higher than those of reported by the original API sample, suggesting that AUB students as a whole, reported more liberal attitudes than a community sample in the Arab Levant.

Although not part of our original hypotheses, we tested whether there are any gender differences on personality scores. We found that males scored lower than females on IPIP Agreeableness ( $M$  diff = 2.62;  $t = 2.60$ ;  $p < .001$  ;  $d = .60$  ), and API Honesty-Humility-Integrity ( $M$  diff = 2.1;  $t = 2.36$ ;  $p = .02$  ;  $d = .37$ ).

*Table 3*  
*Descriptive Statistics of Personality Variables (N=197)*

Scale	N	Min.	Max.	Mean	SD
<b>Arab Personality Inventory</b>					
Agreeableness	197	30.00	50.00	39.47	4.26
Extraversion	197	26.00	50.00	38.23	5.28
Honesty humility	197	20.00	50.00	36.92	5.67
Intellect	197	24.00	50.00	36.86	4.61
Conscientiousness	197	23.00	49.00	36.15	4.87
Emotional Stability	197	14.00	48.00	27.77	6.85
(Un)conventionality	197	10.00	44.00	25.56	5.76
<b>International Personality Item Pool</b>					
Agreeableness	197	23.00	48.00	36.78	4.79
Openness	197	23.00	50.00	36.12	6.10
Extraversion	197	14.00	49.00	32.59	6.53
Conscientiousness	197	15.00	48.00	32.12	5.65
Neuroticism	197	12.00	50.00	29.12	6.85

### ***College Major***

In terms of college major, a quarter of participants were psychology majors while the second most frequent major was biology, followed by nursing. Table 4 shows the reported college majors, divided as non-STEM and STEM.

*Table 4*  
*Reported College Major*

Major	Frequency	Percent %
<b>Non-STEM</b>		
Psychology	50	25.4
Nursing	18	9.1
Nutrition and Dietetics*	11	5.6
Education	3	1.5
Business	3	1.5
Sociology	4	2.0
Political Science	7	3.6
Economics	3	1.5
Architecture	2	1.0
English	1	.5
Physics	2	1.0
Other*	2	1
<b>STEM</b>		
Medical Imaging Science*	10	5.1
Math	5	2.5
Mechanical Engineering	5	2.5
Chemical Engineering	2	1.0
Biology	30	15.2
Medical Audiology Science*	1	.5
Engineering	2	1.0
Chemistry	16	8.1
Medical Lab Sciences*	8	4.1
Computer Science	3	1.5
Electrical/Computer Engineering	2	1.0
Missing	7	2.5
<b>Total</b>	<b>199</b>	<b>100.0</b>

*Note. STEM = Science, Technology, Engineering and Math as per Koonce et al. (2011)*

*\*Indicates subjectively categorized majors.*

To examine whether AUB students report being enrolled in gender-typical majors, we ran chi-square analysis and showed that frequencies between males and females were significantly different (table 5),  $X^2(1, N = 192) = 7.70, p = .006$ .

*Table 5*  
*Cross Tabulation of Gender and STEM & Non-STEM Majors*

			College Majors		Total
			Non-Stem	STEM	
Gender	Male	Count	21	32	53
		% within gender	39.6%	60.4%	100.0%
Gender	Female	Count	86	53	139
		% within gender	61.9%	38.1%	100.0%
Total	Count		107	85	192
	% within gender		55.7%	44.3%	100.0%

### **Main Effect: Vocational Interests and Gender**

Based on mean scores, the current sample scored highest on the Social interest ( $M = 36.35, SD = 6.69$ ) and lowest on the Realistic interest ( $M = 23.32, SD = 7.81$ ).

*Table 6*  
*Descriptive Statistics of Vocational Interests (N = 197)*

	Mean	SD	Min.	Max.
Social	36.35	6.69	12.00	50.00
Investigative	33.92	8.79	10.00	50.00
Artistic	33.02	9.15	10.00	50.00
Enterprising	30.94	7.95	10.00	50.00
Conventional	23.85	8.21	10.00	50.00
Realistic	23.32	7.81	10.00	48.00

To test our first hypothesis (*females will score higher on Artistic, Conventional and Social interests, and males will score higher on Realistic and Investigative interests*) we examined whether there are gender differences in vocational interests. Contrary to our hypothesis, we did not find gender differences on Social and Artistic interests, and men, instead of women, scored higher on Conventional interests ( $d=.47$ ). However, in line with our hypothesis about men, there was a significant and small-to-moderate magnitude difference in scores, with males scoring higher than females on Investigative, and Realistic interests. Based on these results (Table 4), we fail to reject the null hypothesis that there is no main effect between gender and vocational interests, and partially accept the first hypothesis since we found a difference only on the Investigative and Realistic interests.

*Table 7*  
*Gender Differences in Vocational Interest Means*

	Gender		t	df	p-value*	Cohen's d
	Females M (SD)	Males M (SD)				
Investigative	33.25 (9.36)	35.68 (6.85)	2.00	195	.05	.30
Realistic	22.33 (7.55)	25.97 (7.92)	2.98	195	.003	.49
Conventional	22.83 (8.26)	26.55 (7.49)	2.89	195	.004	.47

Note:  $df$  = degrees of freedom. \*Alpha set at 0.05

### **Interaction Effect: (Un)conventionality/Openness and Gender Predict Interests**

To test the second hypothesis that (Un)conventionality or Openness will moderate the relationship between gender and interests, we conducted hierarchical multiple regression. In the first step, we entered gender on its own, and in the second step we entered one of the models of personality (API or IPIP) and in the third step, we entered the interaction of gender and

(Un)conventionality (from API) or Openness (from IPIP). The regressions were repeated for all six RIASEC dimensions as outcomes.

In the analysis, we did not find any main effects nor an interaction between gender and Openness in predicting RIASEC scores. In the analysis using API scales (i.e. (Un)conventionality in the interaction), the overall model (all API variables, gender, and the interaction between (Un)conventionality and gender), accounted for 14% of variance in *Social* interest scores,  $R^2 = .14$ ,  $F(7, 188) = 4.76$ ,  $p < .001$ . However, the interaction of (Un)conventionality and gender alone, accounted for a small but significant incremental change in the variance in Social interest scores,  $\Delta R^2 = .02$ ,  $\Delta F(1, 187) = 4.66$ ,  $p < .001$ . Figure 2 illustrates the relationship between gender, (Un)conventionality, and Social interests.

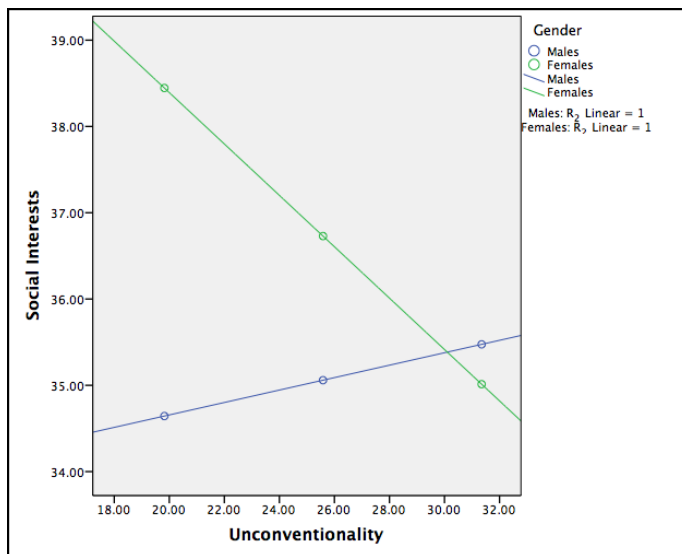


Fig. 2 Interaction between (Un)conventionality and Gender on Social Interest Scores.

Based on the above, there is no interaction effect between (Un)conventionality and gender in predicting vocational interests. Results indicate that (Un)conventionality moderates the relationship between gender and Social interests, so that the more a woman reports to be tradition-bound (low (Un)conventionality score), the higher her scores on the Social interest (a female-typical interest), when compared to a woman scoring high on (Un)conventionality.

Conversely, the more a male is tradition-bound (low scores on (Un)conventionality), the less reported Social interests compared to a man who is more progressive. These findings are consistent with hypothesis two. A simple slope analysis revealed that the effect of (Un)conventionality on Social interests is stronger for women with a slope of -0.29 compared to a slope of 0.07 for men.

### **Discussion**

In this paper, we hypothesized that students' interests on the RIASEC would be divided along gender lines, yet those who report to be unconventional would be more likely to go against gender-typical vocational interests. We found partial support for our hypotheses. As a main effect, men were indeed more interested than women in Realistic and Investigative domains. In terms of interaction, men who reported to be progressive, secular and unbound by tradition (i.e. higher on the trait of (Un)conventionality) were more likely than traditional males, to be interested in Social vocations which are typically female-dominated (interaction effect). Conversely, females reporting high (Un)conventionality, were more likely than those who were traditional, to deviate from gender-typical vocational interests and therefore report little interest in female-dominated Social vocations.

### **Gender Differences (and Similarities) in Vocational Interests**

Men reported much more interest than women, in Investigative and Realistic interests. This supports previous findings that males, on average, have higher Realistic and Investigative scores across cultures and nations (Lippa, 1998; Rounds et al., 2010; Su et al., 2009). On one hand, this main effect lends support for the evolutionary perspective, whereby interests are hardwired and develop differently between the sexes. On the other hand, our other findings go contrary to evolutionary explanations - our women and men equally liked Artistic, and Social interests, and men, instead of women, had Conventional interests.

Although there are several explanations for the above findings, the most plausible explanation is sampling and methodological issues. Primarily, the lack of gender differences in Artistic and Social interests is due to sampling. Our college sample was not sufficiently diverse, with 30% of our male sample being psychology majors, and our entire sample being enrolled in an elective psychology class – a profession coded as Social, and Artistic (O\*NET, 2018). Therefore, we likely failed to detect expected gender differences in those interests because most enrolled students (both men and women) were probably de-facto interested in psychology. As for Conventional interests, where contrary to our hypothesis males scored higher than females, this may be due to the instruments used. The scale of Conventional interests in the O\*Net IP had questions such as “*calculate wages of employees*”, “*install software across computers*” and “*operate a calculator*”, that may have been interpreted as heavily dependent on mathematical skills. Studies have shown that women have less positive attitudes and less self-efficacy towards math than men (Huang, 2013; Hyde, Fennema, Ryan, Frost, & Hopp, 1990). Therefore, it is possible that despite being instructed to think only about interests and not skills, the women in our sample did not endorse these items due to factors other than just interest. Yet, it remains unclear why these items would be interpreted as such in our sample only, and not in other samples. Subsequent studies with larger and more diverse sample, as well as more refined instruments such as a more culture specific vocational interest inventory, may help rule out these methodological issues.

### **Moderating Role of (Un)conventionality on Gender and Social Interests**

Although we did not find any gender differences in Social interests (i.e. no main effect), we did show that (Un)conventionality interacted with gender to predict Social interests. This means that depending on a participant’s gender, their (Un)conventionality scores predicted Social interests differently, such that for males the higher their score on (Un)conventionality the



higher their Social interest scores, while for females the higher their score on (Un)conventionality, the lower their score on Social interests. This finding supports the idea that some people who have gender-atypical interests, may possess a certain unconventional personality disposition.

Therefore, individual differences in personality seem to explain how individuals deviate from “expected” interests. This finding, in addition to many other studies that show how personality traits differentially predict important outcomes for men and women, lends support to the notion that individual traits have a complex interaction with other variables, as predictors of behavior. The Five Factor Model (FFM) of personality posits that the biologically-rooted personality traits like the Big Five, are shaped by our life experiences, narratives, and cultures to give rise to *characteristic adaptations*, which are the observable traits, roles, personal strivings and attitudes that we can introspect and report about (McCrae & Costa, 2008). The men and women in our sample, who reported to be unconventional, may have had a number of experiences that led them to this reported disposition. According to the FFM, two individuals with similar biologically-rooted traits do not necessarily have to develop the same disposition and in fact may turn out to behave very differently. For future studies it would be important to understand *how* the unconventional men and women in our sample came to be, by examining additional variables related to socialization, gender-roles, and life narratives.

A lingering question is why did we find an interaction effect for (Un)conventionality and not Openness in predicting Social interests? One explanation could be that questions of (Un)conventionality had more to do with being tradition-bound than those of Openness which focus more on imagination, art, and abstract thinking. Indeed, one of the main predictors of Artistic interests was Openness ( $b = .58, t(1, 195) = 4.78, p < .001$ ), but not (Un)conventionality. Therefore, although (Un)conventionality was originally construed as a local variant of Openness

by Zeinoun et al. (2017), it may be that the two traits are predictive of different behaviors.

Nonetheless, it remains to be seen whether this finding can be replicated in other samples, and behaviors.

### **College Majors and Gender Differences**

The current study found that men are almost twice as more likely than women to enter a STEM major. This is similar to trends found in many developed and developing countries (Beede et al., 2011), and consistent with reports that women only make up 29% of engineering college students in Lebanon (Yaacoub & Badre (2012). In our sample, 38% of the females were enrolled or intended to enroll in a STEM major which includes engineering majors and other fields such as biology and chemistry. To increase the number of female students in STEM majors, one possible intervention may involve female role-model advisors. Recently, Canaan and Mouganie (2019), in a study conducted on AUB students, showed that if female students are matched with female advisors, they are more likely to enter a STEM major compared to having a male advisor. Future studies could focus on examining other factors that influence female enrollment in STEM majors.

### **Limitations**

This study is not without limitations. First, our sample lacked diversity in interests, which is likely why we did not find a main effect of gender on social interests. Second, the sample also had relatively high scores on (Un)conventionality compared to non-AUB samples, and was recruited exclusively from a rather “progressive” liberal arts institution. Therefore, the uniqueness of the sample prevents us from making generalizations to other college students or the Lebanese population. An introductory psychology pool provides a good sample size, however, future studies wishing to explore why certain students choose a major or have different vocational interests should move away from using a psychology pool due to the lack of

variability in student characteristics on outcome variables such as interests. For example, although the psychology pool is supposed to encompass students from different majors, the fact that those students chose to take a psychology elective class instead of any other social science such as sociology, decreases the variability in interests among students.

Finally, using reported interests instead of actual occupations means that we cannot be sure of what is the real world impact of the interaction between (Un)conventionality and gender. For example, a female could report high levels of (Un)conventionality and be genuinely interested in engineering, however, many reasons could prevent her from eventually acting on those interests. Therefore, the impact of (Un)conventionality on actual behavior remains tentative.

### **Conclusion and Future Directions**

Understanding how personality traits and gender shape vocational interests can help us further appreciate the fluidity of these concepts, and the complex interrelationship between biologically rooted tendencies and socialization, and the methodological issues that encompass it. Future studies ought to unravel this complexity by examining the role of gender roles, socialization, and even culture-level variables with relation to gender and vocational interests. Furthermore, although the RIASEC model has been extensively studied cross-culturally, no published studies that we are aware of examine how the model unfolds in the Middle East. Future studies should examine the fit of the RIASEC model in the Middle East and how it interacts with different outcome variables, while keeping gender differences in mind.

## References

- Aiken, L. S., West, S. G., & Reno, R. R. (1991). Multiple regression: Testing and interpreting interactions. Sage.
- Allik, J., & McCrae, R. R. (2004). Toward a geography of personality traits: Patterns of profiles across 36 cultures. *Journal of Cross-Cultural Psychology*, 35(1), 13-28.
- American University of Beirut (2018). "Fact Book 2016-2017". Retrieved from:  
<https://website.aub.edu.lb/oira/Documents/FB201617.pdf>
- American Psychological Association. (2015). Guidelines for psychological practice with transgender and gender nonconforming people. *American Psychologist*, 70(9), 832-864.
- Barrett, P. T., Petrides, K. V., Eysenck, S. B., & Eysenck, H. J. (1998). The Eysenck Personality Questionnaire: An examination of the factorial similarity of P, E, N, and L across 34 countries. *Personality and Individual Differences*, 25(5), 805-819.
- Beede, D. N., Julian, T. A., Langdon, D., McKittrick, G., Khan, B., & Doms, M. E. (2011). Women in STEM: A gender gap to innovation. *Economics and Statistics Administration Issue Brief*, (04-11).
- Benet-Martínez, V. (2008). Cross-cultural personality research. *Handbook of research methods in personality psychology*, 170-189.
- Buss, D. M., Shackelford, T. K., Kirkpatrick, L. A., Choe, J. C., Lim, H. K., Hasegawa, M., ... & Bennett, K. (1999). Jealousy and the nature of beliefs about infidelity: Tests of competing hypotheses about sex differences in the United States, Korea, and Japan. *Personal relationships*, 6(1), 125-150.
- Bussey, K., & Bandura, A. (1999). Social cognitive theory of gender development and differentiation. *Psychological review*, 106(4), 676.

- Canaan, S., & Mouganie, P. (2019). Female Science Advisors and the STEM Gender Gap. Available at SSRN 3396119.
- Cattell, H. E., & Mead, A. D. (2008). The sixteen personality factor questionnaire (16PF). *The SAGE handbook of personality theory and assessment, 2*, 135-178.
- Carney, D. R., Jost, J. T., Gosling, S. D., & Potter, J. (2008). The secret lives of liberals and conservatives: Personality profiles, interaction styles, and the things they leave behind. *Political Psychology, 29*(6), 807-840.
- Caspi, A., Roberts, B. W., Pervin, L. A., & John, O. P. (1990). Personality continuity and change across the life course. *Handbook of personality: Theory and research, 2*, 300-326.
- Charles, M., & Bradley, K. (2009). Indulging our gendered selves? Sex segregation by field of study in 44 countries. *American journal of sociology, 114*(4), 924-976.
- Costa, P. T., & McCrae, R. R. (1992). Four ways five factors are basic. *Personality and individual differences, 13*(6), 653-665.
- Costa Jr, P. T., & McCrae, R. R. (1992). Neo personality inventory–revised (neo-pi-r) and neo five-factor inventory (NEO-FFI) professional manual. *Odessa, FL: Psychological Assessment Resources*.
- De Fruyt, F., & Mervielde, I. (1997). The five-factor model of personality and Holland's RIASEC interest types. *Personality and individual differences, 23*(1), 87-103.
- DeNeve, K. M., & Cooper, H. (1998). The happy personality: A meta-analysis of 137 personality traits and subjective well-being. *Psychological bulletin, 124*(2), 197.
- De Raad, B., Barelds, D. P., Levert, E., Ostendorf, F., Mlačić, B., Blas, L. D., ... & Church, A. T. (2010). Only three factors of personality description are fully replicable across languages: A comparison of 14 trait taxonomies. *Journal of Personality and Social Psychology, 98*(1), 160.

- DeYoung, C. G., Quilty, L. C., & Peterson, J. B. (2007). Between facets and domains: 10 aspects of the Big Five. *Journal of personality and social psychology, 93*(5), 880.
- DeYoung, C. G. (2014). Openness/Intellect: A dimension of personality reflecting cognitive exploration. *APA handbook of personality and social psychology: Personality processes and individual differences, 4*, 369-399.
- Daouk-Öyry, L., Zeinoun, P., Choueiri, L., & van de Vijver, F. J. (2016). Integrating global and local perspectives in psycholexical studies: A GloCal approach. *Journal of Research in Personality, 62*, 19-28.
- Diekmann, A. B., Steinberg, M., Brown, E. R., Belanger, A. L., & Clark, E. K. (2017). A goal congruity model of role entry, engagement, and exit: understanding communal goal processes in
- Eagly, A. H., Wood, W., Diekmann, A. B., Eckes, T., & Trautner, H. M. (2000). The developmental psychology of gender.
- Fan, W., Cheung, F. M., Leong, F. T., & Cheung, S. F. (2012). Personality traits, vocational interests, and career exploration: A cross-cultural comparison between American and Hong Kong students. *Journal of Career Assessment, 20*(1), 105-119.
- Farth, J. L., Leong, F. T., & Law, K. S. (1998). Cross-cultural validity of Holland's model in Hong Kong. *Journal of vocational behavior, 52*(3), 425-440.
- Ferreira, J. A. A., & Hood, A. B. (1995). The development and validation of a Holland-type Portuguese Vocational Interest Inventory. *Journal of Vocational Behavior, 46*(2), 119-130.
- Fiske, D. W. (1949). Consistency of the factorial structures of personality ratings from different sources. *The Journal of Abnormal and Social Psychology, 44*(3), 329.

- Goldberg, L. R. (1981). Language and individual differences: The search for universals in personality lexicons. *Review of personality and social psychology*, 2(1), 141-165.
- Goldberg, L. R. (1990). An alternative" description of personality": the big-five factor structure. *Journal of personality and social psychology*, 59(6), 1216.
- Goldberg, L. R. (1992). The development of markers for the Big-Five factor structure. *Psychological assessment*, 4(1), 26.
- Goldberg, L. R. (1999). A broad-bandwidth, public domain, personality inventory measuring the lower-level facets of several five-factor models. *Personality psychology in Europe*, 7(1), 7-28.
- Goldberg, L. R. (2015). International Personality Item Pool: A scientific collaboratory for the development of advanced measures of personality traits and other individual differences. Retrieved from <http://ipip.ori.org/>
- Goldberg, L. R., & Rosolack, T. K. (1994). The Big Five factor structure as an integrative framework: An empirical comparison with Eysenck's PEN model. *The developing structure of temperament and personality from infancy to adulthood*, 7-35.
- Gnamb, T. (2015). Facets of measurement error for scores of the Big Five: Three reliability generalizations. *Personality and Individual Differences*, 84, 84-89.
- Gasser, C. E., Larson, L. M., & Borgen, F. H. (2007). Concurrent validity of the 2005 Strong Interest Inventory: An examination of gender and major field of study. *Journal of Career Assessment*, 15(1), 23-43.
- Gottfredson, L. S. (1981). Circumscription and compromise: A developmental theory of occupational aspirations. *Journal of Counseling psychology*, 28(6), 545.

- Gottfredson, G. D., Jones, E. M., & Holland, J. L. (1993). Personality and vocational interests: The relation of Holland's six interest dimensions to five robust dimensions of personality. *Journal of Counseling Psychology, 40*(4), 518.
- Hansen, J. I. C., & Dik, B. J. (2005). Evidence of 12-year predictive and concurrent validity for SII Occupational Scale scores. *Journal of Vocational Behavior, 67*(3), 365-378.
- Hirsh, J. B., DeYoung, C. G., Xu, X., & Peterson, J. B. (2010). Compassionate liberals and polite conservatives: Associations of agreeableness with political ideology and moral values. *Personality and Social Psychology Bulletin, 36*(5), 655-664.
- Holland, J. L. (1959). A theory of vocational choice. *Journal of counseling psychology, 6*(1), 35.
- Holland, J. L., Johnston, J. A., & Francis Asama, N. (1994). More evidence for the relationship between Holland's personality types and personality variables. *Journal of Career Assessment, 2*(4), 331-340.
- Holland, J. L. (1997). Making vocational choices: A theory of vocational personalities and work environments. Psychological Assessment Resources.
- Huang, C. (2013). Gender differences in academic self-efficacy: A meta-analysis. *European journal of psychology of education, 28*(1), 1-35.
- Hyde, J. S., Fennema, E., Ryan, M., Frost, L. A., & Hopp, C. (1990). Gender comparisons of mathematics attitudes and affect: A meta-analysis. *Psychology of women quarterly, 14*(3), 299-324.
- Judge, T. A., Higgins, C. A., Thoresen, C. J., & Barrick, M. R. (1999). The big five personality traits, general mental ability, and career success across the life span. *Personnel psychology, 52*(3), 621-652.
- Kuder, G. F. (1939). The stability of preference items. *The Journal of Social Psychology, 10*(1), 41-50.



Koonce, D. A., Zhou, J., Anderson, C. D., Hening, D. A., & Conley, V. M. (2011). AC 2011-289: What is STEM. In *American Society for Engineering Education*.

Laher, S., Zeinoun, P., Cheung F. (in progress). Gender and Personality Research In Psychology: The Need For Intersectionality. In F. Cheung & D. Halpern (Eds.), *The Cambridge handbook of the international psychology of women*. Cambridge: Cambridge University Press

Larson, L. M., Rottinghaus, P. J., & Borgen, F. H. (2002). Meta-analyses of Big Six interests and Big Five personality factors. *Journal of Vocational Behavior*, *61*(2), 217-239.

Lee, K., & Ashton, M. C. (2008). The HEXACO personality factors in the indigenous personality lexicons of English and 11 other languages. *Journal of personality*, *76*(5), 1001-1054.

Leong, F. T., Austin, J. T., Sekaran, U., & Komarraju, M. (1998). An evaluation of the cross-cultural validity of Holland's theory: Career choices by workers in India. *Journal of Vocational Behavior*, *52*(3), 441-455.

Lidy, K. M., & Kahn, J. H. (2006). Personality as a Predictor of First-Semester Adjustment to College: The Mediational Role of Perceived Social Support. *Journal of College Counseling*, *9*(2), 123-134.

Lippa, R. (1998). Gender-related individual differences and the structure of vocational interests: The importance of the people–things dimension. *Journal of personality and social psychology*, *74*(4), 996.

Lippa, R. A. (2010). Gender differences in personality and interests: When, where, and why? *Social and personality psychology compass*, *4*(11), 1098-1110.

- Low, K. D., Yoon, M., Roberts, B. W., & Rounds, J. (2005). The stability of vocational interests from early adolescence to middle adulthood: a quantitative review of longitudinal studies. *Psychological bulletin*, *131*(5), 713.
- Malgwi, C. A., Howe, M. A., & Burnaby, P. A. (2005). Influences on students' choice of college major. *Journal of Education for Business*, *80*(5), 275-282.
- McCrae, R. R., & John, O. P. (1992). An introduction to the five-factor model and its applications. *Journal of personality*, *60*(2), 175-215.
- McCrae, R. R. (1994). Openness to experience: Expanding the boundaries of Factor V. *European Journal of Personality*, *8*(4), 251-272.
- McCrae, R. R., & Costa Jr, P. T. (1997). Personality trait structure as a human universal. *American psychologist*, *52*(5), 509.
- McCrae, R. R., & Terracciano, A. (2005). Universal features of personality traits from the observer's perspective: data from 50 cultures. *Journal of personality and social psychology*, *88*(3), 547.
- Musek, J. (2007). A general factor of personality: Evidence for the Big One in the five-factor model. *Journal of Research in Personality*, *41*(6), 1213-1233.
- Nauta, M. M. (2010). The development, evolution, and status of Holland's theory of vocational personalities: Reflections and future directions for counseling psychology. *Journal of counseling psychology*, *57*(1), 11.
- Nguyen, N. T., Allen, L. C., & Fraccastoro, K. (2005). Personality predicts academic performance: Exploring the moderating role of gender. *Journal of Higher Education Policy and Management*, *27*(1), 105-117.

- Ott-Holland, C. J., Huang, J. L., Ryan, A. M., Elizondo, F., & Wadlington, P. L. (2013). Culture and vocational interests: The moderating role of collectivism and gender egalitarianism. *Journal of counseling psychology, 60*(4), 569.
- Prediger, D. J. (1982). Dimensions underlying Holland's hexagon: Missing link between interests and occupations?. *Journal of Vocational Behavior, 21*(3), 259-287.
- Porter, S. R., & Umbach, P. D. (2006). College major choice: An analysis of person–environment fit. *Research in higher education, 47*(4), 429-449.
- Roberts, B. W., Kuncel, N. R., Shiner, R., Caspi, A., & Goldberg, L. R. (2007). The power of personality: The comparative validity of personality traits, socioeconomic status, and cognitive ability for predicting important life outcomes. *Perspectives on Psychological science, 2*(4), 313-345.
- Rounds, J., Su, R., Lewis, P., & Rivkin, D. (2010). O\* NET interest profiler short form psychometric characteristics: Summary. *Raleigh, NC: National Center for O\* NET Development.*
- Ruble, D. N., Martin, C. L., & Berenbaum, S. A. (1998). Gender development. *Handbook of child psychology.*
- Saucier, G., Thalmayer, A. G., & Bel-Bahar, T. S. (2014). Human attribute concepts: Relative ubiquity across twelve mutually isolated languages. *Journal of personality and social psychology, 107*(1), 199.
- Stoet, G., & Geary, D. C. (2018). The gender-equality paradox in science, technology, engineering, and mathematics education. *Psychological science, 29*(4), 581-593.
- Strong, E. K., Jr. (1943). *Vocational interests of men and women.* Stanford, CA: Stanford University Press.

- Su, R., Rounds, J., & Armstrong, P. I. (2009). Men and things, women and people: a meta-analysis of sex differences in interests. *Psychological bulletin*, *135*(6), 859.
- Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics*. Allyn & Bacon/Pearson Education.
- Tang, M. (2001). Investigation of the structure of vocational interests of Chinese college students. *Journal of Career Assessment*, *9*(4), 365-379.
- Tang, M. (2009). Examining the application of Holland's theory to vocational interests and choices of Chinese college students. *Journal of career Assessment*, *17*(1), 86-98.
- Tracey, T. J., & Hopkins, N. (2001). Correspondence of interests and abilities with occupational choice. *Journal of counseling psychology*, *48*(2), 178.
- O\*Net. O\*NET Interest Profiler. Retrieved from: <https://www.onetcenter.org/IP.html>
- van Tuijl, C., & Walma van der Molen, J. H. (2015). Study choice and career development in STEM fields: an overview and integration of the research. *26*(2), 159-183. DOI: [10.1007/s10798-015-9308-1](https://doi.org/10.1007/s10798-015-9308-1)
- Wall, J. E., & Baker, H. E. (1997). The interest-finder: Evidence of validity. *Journal of Career Assessment*, *5*(3), 255-273.
- Wood, W., & Eagly, A. H. (2002). A cross-cultural analysis of the behavior of women and men: Implications for the origins of sex differences. *Psychological bulletin*, *128*(5), 699.
- Woods, S. A., & Hampson, S. E. (2010). Predicting adult occupational environments from gender and childhood personality traits. *Journal of Applied Psychology*, *95*(6), 1045.
- Yaacoub, N., & Badre, L. (2012). Education in Lebanon. Statistics in Focus (SIF), Central Administration of Statistics: Beirut, Lebanon.

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*, *113*(3), 453.

Zeinoun, P., Daouk-Öyry, L., Choueiri, L., & van de Vijver, F. J. (2018). Arab-Levantine personality structure: A psycholexical study of modern standard Arabic in Lebanon, Syria, Jordan, and the West Bank. *Journal of personality*, *86*(3), 397-421.

**Appendix A****ONLINE INSTRUMENTS****Demographics**

1. Gender: (*drop down menu*)
  - a. Male
  - b. Female
2. Age: (*Drop down menu from 18 to 65*)
3. Level of education: (*drop down menu*)
  - a. Freshman
  - b. Sophomore
  - c. Junior
  - d. Senior
4. Declared/prospective major: \_\_\_\_\_
5. Declared/prospective minor: \_\_\_\_\_
6. Year of entry into university: (*drop down menu 2015 to 2019*) \_\_\_\_\_
7. Family income bracket: (*drop down menu*)
  - a. Less than \$20,000
  - b. \$20,000 to \$34,999
  - c. \$35,000 to \$49,999
  - d. \$50,000 to \$74,999
  - e. \$75,000 to \$99,999
  - f. Over \$100,000
8. What is the highest level of education completed by your **mother**? (*drop down menu*)
  - a. Less than a high school diploma
  - b. High school degree or equivalent



A14	1	I am humble	5	4	3	2	1
A14	2	I am studious	5	4	3	2	1
A34	3	I am an anxious person	5	4	3	2	1
A78	4	I am entertaining to those around me	5	4	3	2	1
A40	5	I sometimes like it when others feel	5	4	3	2	1
A41	6	I have depth, as a person	5	4	3	2	1
A14	7	When life is good, it is because God	5	4	3	2	1
A15	8	I am fair to/with others	5	4	3	2	1
A7	9	I am skillful	5	4	3	2	1
A38	10	I am depressed	5	4	3	2	1
A96	11	I am fun-loving	5	4	3	2	1
A11	12	I am tyrannical	5	4	3	2	1
A61	13	I am wise	5	4	3	2	1
A12	14	I am generally obedient	5	4	3	2	1
A25	15	I encourage others for the better	5	4	3	2	1
A4	16	I am successful at my work/study	5	4	3	2	1
A46	17	I take things personally	5	4	3	2	1
A97	18	I laugh a lot	5	4	3	2	1
A13	19	I tend to make others feel guilty for not	5	4	3	2	1
A84	20	I am calm by nature	5	4	3	2	1
A19	21	I abide by my religious duties	5	4	3	2	1
A25	22	I like to teach others	5	4	3	2	1
A10	23	I am committed to my work/study	5	4	3	2	1
A52	24	I am impulsive in my behaviors	5	4	3	2	1
A10	25	I am a sociable person	5	4	3	2	1
A14	26	I am a greedy person	5	4	3	2	1
A19	27	I am inquisitive	5	4	3	2	1
A18	28	I come from a family of good social	5	4	3	2	1
A25	29	I tend to adapt easily to different	5	4	3	2	1



A27	30	I am practical	5	4	3	2	1
A59	31	I feel internal conflicts between myself	5	4	3	2	1
A90	32	I make others laugh	5	4	3	2	1
A15	33	I prefer to work with people from my	5	4	3	2	1
A20	34	I am intelligent	5	4	3	2	1
A17	35	I love my nation	5	4	3	2	1
A26	36	I am respectful	5	4	3	2	1
A23	37	I am a self-made person	5	4	3	2	1
A67	38	I am a moody person	5	4	3	2	1
A95	39	I am spontaneous	5	4	3	2	1
A16	40	I am exploitative	5	4	3	2	1
A20	41	I am sophisticated	5	4	3	2	1
A15	42	Preserving my honor is very important	5	4	3	2	1
A28	43	I am altruistic	5	4	3	2	1
A70	44	I am a confident person	5	4	3	2	1
A71	45	I get angry easily	5	4	3	2	1
A92	46	I care about my looks	5	4	3	2	1
A18	47	I am unethical	5	4	3	2	1
A21	48	I am rational in what I do	5	4	3	2	1
A22	49	I am a conservative person	5	4	3	2	1
A29	50	I feel with others	5	4	3	2	1
A82	51	I am energetic	5	4	3	2	1
A73	52	I get bored easily	5	4	3	2	1
A22	53	I am a modern person	5	4	3	2	1
A18	54	I am extreme in my religiousness	5	4	3	2	1
A21	55	I think realistically about situations	5	4	3	2	1
A23	56	I strike a balance between openness and	5	4	3	2	1
A31	57	I am tolerant of others' opinions	5	4	3	2	1

A79	58	I am a brave person	5	4	3	2	1
A98	59	I generally frown	5	4	3	2	1
A27	60	I have a charismatic presence	5	4	3	2	1
A21	61	I am backwards in my thinking	5	4	3	2	1
A22	62	I always have creative ideas	5	4	3	2	1
A23	63	I am a fanatic	5	4	3	2	1
A31	64	I am trusting of others	5	4	3	2	1
A11	65	I am generally firm with others	5	4	3	2	1
A25	66	I am a stubborn person	5	4	3	2	1
A26	67	I am pleasant to be around	5	4	3	2	1
A26	68	I am annoying	5	4	3	2	1
A28	69	My comments are well thought of	5	4	3	2	1
A22	7	I am secular	5	4	3	2	1

**INTERNATIONAL PERSONALITY ITEM POOL (IPIP)**

Below are a series of statements that people use to describe themselves. Please read each statement and decide how much you agree or disagree with the extent to which it applies to you.

Please answer every statement, even if you are not completely sure of your response.

	<b>Very Inaccurate</b>	<b>Moderately Inaccurate</b>	<b>Neither Accurate Nor Inaccurate</b>	<b>Moderately Accurate</b>	<b>Very Accurate</b>
1. I am the life of the party.					
2. I feel little concern for others					
3. I am always prepared					

4. I get stressed out easily.					
5. I have a rich vocabulary.					
6. I don't talk a lot					
7. I am interested in people					
8. I leave my belongings around.					
9. I am relaxed most of the time.					
10. I understand abstract ideas					
11. I feel comfortable around people.					
12. I insult people.					
13. I pay attention to details.					
14. I worry about things.					
15. I have a vivid imagination.					
16. I keep in the background					
17. I sympathize with others' feelings.					
18. I make a mess of things.					
19. I seldom feel blue.					
20. I am not interested in abstract ideas.					
21. I start conversations.					
22. I am not interested in other people's problems.					

23. I get chores done right away.					
24. I am easily disturbed.					
25. I have excellent ideas.					
26. I have little to say.					
27. I have a soft heart.					
28. I often forget to put things back in their place.					
29. I get upset easily.					
30. I do not have a good imagination.					
31. I talk to a lot of different people at parties.					
32. I am not really interested in others.					
33. I like order.					
34. I change my mood a lot.					
35. I am quick to understand things.					
36. I don't like to draw attention to myself.					
37. I take time out for others.					
38. I shirk (neglect) my duties.					
39. I have frequent mood swings.					

40. I use difficult words.					
41. I don't mind being the center of attention.					
42. I feel others' emotions					
43. I follow schedule					
44. I get irritated easily.					
45. I spend time reflecting on things.					
46. I am quiet around strangers					
47. I make people feel at ease.					
48. I am exacting in my work.					
49. I often feel blue.					
50. I am full of ideas.					
51. I am original, and can come up with new ideas					
52. I am curious about many different things.					
53. I am ingenious, a deep thinker.					
54. I have an active imagination.					
55. I am inventive.					
56. I value artistic, aesthetic experiences.					
57. I like to reflect, play with ideas.					

58. I prefer work that is routine.					
59. I have few artistic interests.					
60. I am sophisticated in art, music, or literature.					

**O\*NET INTEREST PROFILER - SHORT FORM**

Read each question carefully and decide how you would feel about doing each type of work:

**As you answer the questions:**

Try **NOT** to think about:

- If you have enough **education or training** to do the work; or
- How much **money** you would make doing the work.

Just think about if you would **like or dislike** doing the work. Avoid the choice of “Unsure” as much as possible.

Question	Like	Unsure	Dislike
1. Build kitchen cabinets			
2. Lay brick or tile			
3. Develop a new medicine			
4. Study ways to reduce water pollution			
5. Write books or plays			
6. Play a musical instrument			
7. Teach an individual an exercise routine			
8. Help people with personal or emotional problems			
9. Buy and sell stocks and bonds			
10. Manage a retail store			

11. Develop a spreadsheet using computer software			
12. Proofread records or forms			
13. Repair household appliances			
14. Raise fish in a fish hatchery			
15. Conduct chemical experiments			
16. Study the movement of planets			
17. Compose or arrange music			
18. Draw pictures			
19. Give career guidance to people			
20. Perform rehabilitation therapy			
21. Operate a beauty salon or barber shop			
22. Manage a department within a large company			
23. Install software across computers on a large network			
24. Operate a calculator			
25. Assemble electronic parts			
26. Drive a truck to deliver packages to offices and homes			
27. Examine blood samples using a microscope			
28. Investigate the cause of a fire			
29. Create special effects for movies			
30. Paint sets for plays			
31. Do volunteer work at non-profit organization			
32. Teach children how to play sports			
33. Start your own business			

34. Negotiate business contracts			
35. Keep shipping and receiving records			
36. Calculate the wages of employees			
37. Test the quality of parts before shipment			
38. Repair and install locks			
39. Develop a way to better predict the weather			
40. Work in a biology lab			
41. Write scripts for movies or television shows			
42. Perform jazz or tap dance			
43. Teach sign language to people who are deaf or hard of hearing			
44. Help conduct a group therapy session			
45. Represent a client in a lawsuit			
46. Market a new line of clothing			
47. Inventory supplies using a hand-held computer			
48. Record rent payments			
49. Set up and operate machines to make products			
50. Put out forest fires			
51. Invent a replacement for sugar			
52. Do laboratory tests to identify diseases			
53. Sing in a band			
54. Edit movies			
55. Take care of children at a day-care center			



56. Teach a high-school class			
57. Sell merchandise at a department store			
58. Manage a clothing store			
59. Keep inventory records			
60. Stamp, sort, and distribute mail for an organization			

## Appendix B

### Principle Component Analysis (PCA) of Arab Personality Inventory (API)

	I	II	III	IV	V	VI	VII
I sometimes like it when others feel sorry for me		0.402					0.475
Obedient			0.301	0.348			0.319
Moody person		0.706					-.315
Sophisticated						0.36	-.316
Spontaneous	0.577						-.317
Self-made							-.319
Get angry easily		0.645					-.355
Strike a balance between openness and conservativeness			0.392				-.374
Stubborn person		0.431					-.438
Love my nation							-.451
Preserving honor is very important			0.444				-.474
Committed to my work/study						0.689	
Successful at work/study						0.632	
Studious						0.551	
Skillful						0.521	
Intelligent						0.508	
Rational in what I do						0.507	
Wise						0.493	
Have depth as a person						0.378	

Think realistically about situations				0.382		0.354	
Comments are well thought of				0.392		0.319	
Always have creative ideas	0.383					0.308	
I am backwards in my thinking					0.38	-0.319	
Generally firm with others					0.605		
Fanatic					0.54		
Make others feel guilty for not meeting expectations		0.321			0.471		
Exploitative		0.365			0.41		
Unethical				-0.346	0.387		
I am tyrannical				-0.427	0.347		
Confident	0.385	-0.398			0.323		
Modern person	0.306				-0.333		
Humble					-0.401		
Fair to/with others				0.747			
Respectful				0.639			
Encourage others for the better				0.607			
Practical				0.539			
Calm by nature	-0.431			0.514			
Tolerant of others' opinions				0.492			
Feel with others				0.432			
Tend to adapt easily to different situations				0.331			
I am fun loving	0.528			0.304			
I prefer to work with people from my family, even			0.414	-0.30			

if others are better							
When life is good it is because God meant it as such			0.833				
Abide by religious duties			0.816				
I am extreme in my religiousness			0.628				
Conservative			0.608				
Secular			-.578				
I am an anxious person		0.716					
Feel internal conflicts between self and society		0.638					
Take things personally		0.599					
Depressed		0.599					
Frown	-.401	0.455					
Get bored easily		0.447					
Impulsive in behaviors	0.427	0.397					
I am annoying		0.39					
Greedy person		0.343					
Social person	0.678						
I am entertaining to those around me	0.678						
Energetic	0.61						
Make others laugh	0.606						
I have a charismatic presence	0.563						
I laugh a lot	0.523						
I am pleasant to be around	0.484						
Brave	0.415						

Like to teach others	0.348						
Altruistic							
Trusting of others							
Care about looks							
Inquisitive							
I come from a family of good social standing							

I= Extraversion; II=Emotional Stability; III= Unconventionality; IV= Agreeableness; V=

Honesty-Humility; VI= Intellect/Conscientiousness.

### Appendix C

#### Principle Component Analysis (PCA) of International Personality Item Pool (IPIP)

	I	II	III	IV	V
I make plans and stick to them					0.808
I carry out my plans					0.699
I am always prepared					0.677
I get chores done right away					0.583
I am pleased with myself	0.379	-0.42			0.498
I pay attention to details				0.374	0.318
I feel comfortable with myself	0.37	-0.36			0.301
I dislike myself	-0.32	0.485			-0.303
I find it difficult to get down to work		0.301			-0.50
I shirk (neglect) my duties		0.331	0.306		-0.502
I waste my time					-0.554
I have a good word for everyone	0.342			0.638	
I accept people as they are				0.63	
I respect others				0.629	
I enjoy hearing new ideas			-0.356	0.518	
I do enough work to just get by			0.334	0.388	
I make people feel at ease	-0.433			0.379	
I believe that others have good intentions				0.369	
I believe in the importance of art			-0.606	0.356	
I rarely get irritated		-0.377		0.353	

I am not easily bothered by things		-0.394		0.325	
I don't like art			0.674	-0.369	
I cut others to pieces		0.436		-0.387	
I have a sharp tongue		0.371		-0.394	
I insult people				-0.581	
I am not interested in abstract ideas			0.686		
I tend to vote for candidates from specific political parties			0.594		
I avoid philosophical ideas			0.584		
I have little to say	-0.484		0.465		
I don't see things through		0.374	0.461		
I do not enjoy going to art museums			0.454		
I get back at others		0.368	0.336		
I don't talk a lot	-0.673		0.328		
I would describe my experiences as somewhat dull	-0.417	0.303	0.304		
I have a vivid imagination			-0.363		
I tend to vote for secular candidates			-0.42		
I have frequent mood swings		0.704			
I am often down in the dumps		0.657			
I panic easily		0.638			
I often feel blue		0.637			
I suspect hidden motives in others		0.322			

I make friends easily	0.668				
I am skilled in handling social situations	0.658				
I know how to captivate people	0.653				
I am the life of the party	0.617				
I feel comfortable around people	0.602				
I carry the conversation to a higher level	0.505				
I keep in the background	-0.417				
I don't like to draw attention to myself	-0.479				
I seldom feel blue					

I= Extraversion; II=Neuroticism; III=Openness; IV=Agreeableness; IV= Conscientiousness