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Inferring Big Five Personality Factors using Text Analysis Its Assessment and Impact on Prosocial Behavior and IS Security Compliance

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Abstract

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Advances in Artificial Intelligence (AI) in general and text mining in particular have resulted in a number of services and applications that infer and provide personality measures from text. The validity of these services, however, has not been subjected to serious empirical scrutiny. The first essay is conducted to validate three services/programs, namely, IBM Watson Personality Insights, Indico, and Personality Recognizer. Specifically, this essay compares the results of these services with those obtained from traditional personality questionnaires. Simple and short essays written by two hundred and fifty-six university students/subjects served as inputs to the personality service programs, while traditional personality measures were assessed using an empirically validated personality questionnaire. The results from both data generation techniques were then compared. Results show that most of the assessments differ. However, there is similarity between the traditional questionnaires and IBM Watson Personality Insights in the case of extraversion measures. Both Indico and Personality Recognizer also showed similarity in the prediction of openness. The second study deals with the relationship between the Big Five and both prosocial moral reasoning and propensity to help. The same subjects from the first study completed a survey in which they were asked to choose whether to help after being given situational scenarios about individuals in need of help. The results of a mediation model showed that both conscientiousness and emotional stability were positively and significantly related to propensity to help. The third essay examines the moderating effect of the Big Five personality

traits on the relationship between conflict in the work setting and noncompliance behavior (using proprietary information for one's own personal advantage rather than that of one's company). After collecting survey responses from the same students from the first two studies, and applying moderation to it using SPSS, we find that both conscientiousness and emotional stability moderate the relationship while the other three of the Big Five (openness, extraversion, and agreeableness) do not. Conflict was found to be negatively and significantly related to noncompliance behavior. The implications of the research for theory and practice are discussed.

Copyright

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Chapter 1: General Introduction

We are in an era of innovation and technology. Many techniques such as artificial intelligence, data mining, text mining, machine learning, or deep learning have been highly used in industry as well as in academia. Many companies, using these data science techniques, provide services (via the use of application programming interfaces) to compute measures from texts. Some of these measures include the Big Five personality traits, which have been widely used in empirical studies. As a matter of fact, the Big Five personality traits are openness, conscientiousness, extraversion, agreeableness, and neuroticism/emotional stability. These personality traits, reflected to varying degrees in individuals, have been studied in a plethora of domains such as inception (McCrae & Costa, 1987; Mccrae et al., 1992), health (Hampson et al., 2016), work performance (Lado & Alonso, 2017; Salgado, 2002), and academic performance (Digman, 1989; Kelsen & Liang, 2019; Komarraju, Karau, & Schmeck, 2009; Komarraju, Karau, Schmeck, & Avdic, 2011).

This research is composed of three essays. The first deals with how the Big Five inferring services/programs (IBM Watson Personality Insights, Indico, Personality Recognizer) perform against the already-validated traditional Big Five instrument. Indeed, these services are being increasingly used without empirical validation . The first essay fulfills that requirement as it compares the measures calculated by each of the services against the ones provided by the traditional Big Five questionnaire.

The second essay uses the Big Five as antecedents to both prosocial moral reasoning (the thinking process to decide whether or not to help given any situations) and propensity to help. This essay extends the extant literature on prosocial moral reasoning (Carlo, Eisenberg, & Knight, 1992; Carlo, Mestre, Samper, Tur, & Armenta, 2011; Eisenberg-Berg, 1979a). To our

knowledge, there have not been any empirical studies on the impact of the Big Five traits on prosocial moral reasoning. As a consequence, this second essay contributes to the literature as it examines the effect of each of the Big Five characteristics on both prosocial moral reasoning and the propensity to help.

The third essay, which also falls in the domain of the Big Five framework, investigates the moderating effect of personality traits on the relationship between conflict and noncompliance behavior in the work environment. The motivation for this is to see and understand how personality traits affect the compliance/noncompliance of information security policy under the condition of insider threat (i.e., employees being the security threat of their own company). Another reason for this is that the Big Five has not been used in the context of conflict and noncompliance behavior. Needless to say that conflict, depending on the context, can trigger anger or frustration, which also can lead to thoughts of retaliating. For example, Nurbhai (2014) proposed a model in which conflict leads to anger, which, in turn, is associated with noncompliance behavior. The author used anger control as a moderator. This essay uses the Big Five factors as moderators.

The rest of this dissertation research is structured as follows. The first research essay, which compares personality characteristics inferred from text with those measured using previously used instruments, is presented in the first chapter. The subsequent chapter describes the study that was performed to investigate the relationships between personality characteristics and prosocial moral reasoning, and the latter's impact on propensity to help. The third study, which looked at the moderating effects of personality on the relationship between conflict and noncompliance behavior, is presented in chapter 3. Finally, we conclude with a summary of the three essays and their findings.

Chapter 2: Essay 1

Introduction/ Background

We are in the midst of a digital revolution that is transforming organizations and compelling us to rethink the way we do business. At the heart of this transformation are new tools and techniques that are quite unlike anything we have seen before. Specifically, researchers have made rapid strides in Artificial Intelligence (AI), machine learning, and Natural Language Processing (NLP), and these advances are now allowing us to harness data in ways that were unthinkable even a decade ago. In the wake of these developments, a number of application programming interfaces (APIs) and/or programs are now available to render a variety of services, including the computation of personality scores from a given corpus of text. The purpose of this study is to compare these measures with those obtained through traditional means.

There is a long-standing tradition of research on personality and its consequences. According to Schultz & Schultz (2008, p. 8), personality "refers to our external and visible characteristics, those aspects of us that other people can see. Our personality would then be defined in terms of the impression we make on others—that is, what we appear to be"(Schultz & Schultz, 2008). Studies on the effects of personality abound (e.g., Cattell, 1957; Faris, Hall, & Lindzey, 1957; Pickford, Eysenck, & Notcutt, 1954), and over the years, researchers have empirically assessed its impact on a variety of outcomes such as organizational citizenship behavior, the propensity of individuals to engage in social and physical activities, consumption preferences (e.g., fast-food, alcohol, vegetables, fruit), the predilection for risky activities, and many other behaviors (de Bruijn, de Groot, van den Putte, & Rhodes, 2009; Gullone & Moore, 2000; Judge, Heller, & Mount, 2002; Raynor & Levine, 2009; Wilson & Dishman, 2015). Different techniques have been used to assess personality. For example "[s]elf-report or objective inventories, projective

techniques, clinical interviews, behavioral assessment procedures, thoughts – and experience-sampling procedures" are the ones that have been utilized particularly in the domain of psychology (Schultz & Schultz, 2008, p. 14). Furthermore, multiple inventories or their derivatives have been used as questionnaires to infer personality. These include the Minnesota Multiphasic Personality Inventory (MMPI), the California Psychological Inventory (CPI), the five-factor personality inventory (FFPI), and the Big Five Inventory (BFI), just to name a few.

In this study, we focus on the Big-Five personality model or the five-factor model that has been widely used in the academic literature (McCrae & Costa, 1987; Mccrae et al., 1992; McCrae & Costa Jr., 2008). The model encompasses five personality traits, namely, agreeableness (disposed to being kind, generous, and considerate), conscientiousness (thorough and responsible individuals who have high levels of aspiration while maintaining integrity), openness (intellectually curious, introspective individuals with a broad range of interests), extraversion (gregarious, active, assertive, and enthusiastic individuals), and neuroticism (individuals who tend to be anxious and unduly worried, often suffering from self-pity and inadequacy, and prone to mood swings) (Mccrae et al., 1992). As mentioned earlier, the express purpose of this study is to investigate the reliability of these five measures as determined by text-mining approaches.

In recent times, researchers have lavished attention on text mining approaches for studying a variety of phenomena (Abbasi, Zhou, Deng, & Zhang, 2018; Aggarwal & Zhai, 2013; Liu, 2012; Nerur & Balijepally, 2015). Based on the premise that the words we use in our writings can, among other things, reflect our moods and emotions as well as reveal our predispositions to certain behaviors, Natural Language Programming (NLP) techniques have emerged to provide measures of basic emotions (e.g., fear, anger, sadness, disgust, joy), personality traits (i.e., the five factors), and language tones (e.g., confident or tentative) (James W Pennebaker, Boyd,

Jordan, & Blackburn, 2015). (As a consequence, a number of services (e.g., IBM's Tone Analyzer and Personality Insights)[1] and software packages such as LIWC (Linguistic Inquiry and Word Count)[2] are now available for computing these measures from text. Researchers are increasingly relying on these services and packages to obtain measures to be used in their empirical studies (Dissanayake, Nerur, Singh, & Lee, 2019; Yin, Bond, & Zhang, 2014). Given the growing interest and increasing reliance on these text-inferred measures, it behooves us to ask how these measures compare with one another as well as with those obtained from a traditional questionnaire that has been the dominant means for measuring personality traits in prior empirical studies.

While it is conceivable that emerging text-dependent services and APIs were planned, analyzed, developed, implemented, and tested for quality, to the best of our knowledge, there is no published empirical validation of their measures. An exception to this is a study by (Harrison, Thurgood, Boivie, & Pfarrer (2019) that developed and validated measures of the five factors using machine learning techniques. While they compared their tool with a software called Personality Recognizer developed by Mairesse, Walker, Mehl, & Moore (2007), the performance of their model vis-à-vis IBM Personality Insights and a traditional questionnaire was not done. Consequently, we have the following research questions: How do IBM Personality Insights, Indico, and Personality Recognizer perform compared with a traditional questionnaire used for

[1] See https://www.ibm.com/watson/services/personality-insights/

[2] http://liwc.wpengine.com/

measuring the five factors? Are the results from the text-based tools consistent, or do they differ significantly?

By comparing text-based measures of personality traits with one another as well as with a validated and widely used questionnaire, our study informs researchers and practitioners about the efficacy of these emerging services. Using text rather than a questionnaire to infer personality characteristics has the advantage of being unobtrusive, but it is still paramount for us to understand how it compares with what prior studies have used for decades. Thus, our study makes a valuable contribution that can give us insight into how reliable our empirical findings are. It also serves as a scholastic article and supporting source from which researchers using the services can base their work.

The remainder of the paper is organized as follows: The next section presents the literature review followed by a description of the methodology. We then discuss the results which are then followed by the implications. We then point out the limitations and complete with the conclusion.

Literature Review

A large amount of research has been conducted on the Big Five on its inception, validation, and its relationship with other concepts such as product design, risk taking, etc.

Multiple inventories or their derivatives have been used as questionnaires to infer personality. Those are the Minnesota Multiphasic Personality Inventory (MMPI), the California Psychological Inventory (CPI), the five-factor personality inventory (FFPI), and the Big Five Inventory (BFI), just to name a few. The personality features that we focus on in this research are the “Big Five”. They represent five personality traits which are agreeableness, conscientiousness,

openness, introversion/extraversion, and neuroticism. The Big Five, also called five-factor model went through multiple analyses. Connor (2002) confirmed its comprehensiveness in connection with popular personality inventories (PPI). The birth of the five traits has two origins which are the lexical origin and the questionnaire (Mccrae et al., 1992). Regarding the lexical origin, the work of Norman represents the commencement of the five-factor model (Norman, 1963). “The order in which these factors emerged roughly parallels their representation among English language trait terms in the dictionary” (Peabody & Goldberg, 1989). Concerning the questionnaire, the emergence of the “modern FFM” especially comes from H.J. Eysenck, “who identified Extraversion (E) and Neuroticism (N) as major components of psychological tests” (Norman, 1963). Later Costa Jr & McCrae (1980) added Openness to Experience (O) and then “created scales to measure Agreeableness (A) and Conscientiousness (C)” (Mccrae et al., 1992). The five-factor model, during its beginning, had to be validated. Its adoption in researches had to be proved; which is what McCrae & Costa (1987) did.

Some research evaluated the comprehensiveness of the five-factor model (Connor, 2002; Mccrae et al., 1992). Connor (2002) did so in accordance with popular inventories on personality. It was found that the structures of the factor could be replicated by combination with the scale from the five-factor model. Mccrae et al. (1992) not only targeted the fullness of the five-factor model, but also supported its cultural relevance. It also goes with (Digman, 1989) who tried to confirm the model. The author found that conscientiousness was highly correlated with academic achievement (Digman, 1989).

After being well established, the statistical validation of the Big Five became less and less the target of researchers who started to emphasize its antecedents and effect on behavior. Clark & Schroth (2010) tried to study the relationship between academic motivation and personality.

Their study revealed that extraversion, agreeableness, conscientiousness, and openness to experience were the traits of the subjects who were intrinsically college motivated. Extraversion, agreeableness, conscientiousness, and neuroticism were related to the subjects who were extrinsically college motivated. Also, being disagreeable and careless were related to the subjects who were not college motivated. Komarraju, Karau, & Schmeck (2009) also found somewhat similar results in their tentative to examine the effect of the Big Five personality traits on academic motivation and achievement of students. They found that four of the five traits (conscientiousness, neuroticism, openness, and agreeableness) explained the variance in GPA.

Research on the Big Five has been done to understand product design. Myszkowski & Storme (2012) examined why individuals choose and value products based on their design. They found that personality affected the choice of better design products. Among the Big Five, openness to experience had some particular importance. It was found that the more one considers the design of products, the less one is open (Myszkowski & Storme, 2012); the capability to evaluate design is in relation to low level of openness (Myszkowski & Storme, 2012); the desire to buy a product because of its very good design is in relation with a low level of openness (Myszkowski & Storme, 2012). (Fraj & Martinez, 2006) also studied the effect of personality on behavior, except that they focus on ecological behavior which is described through the commitment to purchase or act for the wellness of the environment. The authors suggest that extrovert, agreeable, and conscientious individuals could be persuaded by firms to find the need of their products in the environmental context.

Another topic would be that of risk taking and its relationship with the Big Five. As a matter of fact, other researchers examined the relationship between the Big Five personality traits and risk-taking. They found that the effects of personality traits depended on whether demographics were

taken into consideration. In addition, the authors mentioned that being high in openness was related to high risk-taking while being high in neuroticism was related to low risk-taking (Lauriola & Levin, 2001).

The Big Five was also used to study children. Vicent et al. (2019) tried to associate the Big Five personality traits with the self-oriented perfectionism (SOP) types of children between 8 and 11 years of age. Two types of self-oriented perfectionisms were discussed. One was critical (SOP-C) in which the child is unhappy about himself after making a mistake. The other self-oriented perfectionism is striving (SOP-S) in which the child, rather than being hard on himself, always tries his best. The authors find that children who were high in SOP-C scored higher in neuroticism and lower in agreeableness, conscientiousness, and openness than children who were low in SOP-C. The authors also found that children who were high in SOP-S scored higher in openness, conscientiousness, extraversion, and agreeableness. Those children scored lower in neuroticism.

The Big Five was also studied in health and fitness. Scoffier-Mériaux, Falzon, Lewton-Brain, Filaire, & d'arripe-Longueville (2015) investigated the relationship between the Big Five and the eating behavior of dancers. They found that neuroticism was negatively related to the eating self-regulation of the dancers.

Research has also used the Big Five to study health. Hampson et al. (2016) focused on the effect of the childhood personality traits on the health outcome. They found that conscientiousness played a role in the difference in health conditions.

Research has also used the Big Five to study performance. For example, Kelsen & Liang (2019) studied performance of English as a second language students in presentations. They found that

students who were high in extraversion had an advantage in the presentation performance. Regarding job performance, particularly in the context of low-difficulty-level job, (Lado & Alonso (2017) found that both conscientiousness and emotional stability had effects on job, task, and contextual performance. Bolton, Becker, & Barber (2010) also attempted to analyze the relationship between the Big Five and behavior at work. They confirmed that agreeableness predicted counterproductive work behavior. They also reported that extraversion was related to theft and openness was related to production divergence.

Academic performance was also examined to see how the Big Five would affect it. (Komarraju, Karau, Schmeck, & Avdic (2011) noted that both conscientiousness and agreeableness were positively related to the four learning styles which are "synthesis analysis, methodical study, fact retention, and elaborative processing"(Komarraju et al., 2011). Neuroticism, however, negatively predicted those styles. Both extraversion and openness were found to positively predict elaborative processing. Komarraju et al. (2009) also found that conscientiousness partially mediated the relationship between intrinsic motivation and GPA.

The following table (Table 1) is a summary of research focusing on the Big Five personality traits and their associations with other domains or topics (including the ones discussed above). That table shows that the Big Five personality traits have been considered in a large range of topics from its inception even until now. Since the Big Five still represent a topic of interest to researchers at this present time of text analytics, our current study would be very beneficial for them. The reason is that they will be able to use the findings from this study to help them make the right decision as whether they should jump to the bandwagon and use text analytics services or stay in the status quo and use the traditional Big Five questionnaire.

Domain/behavior	**Citation**

Origins and evolution	(McCrae & Costa, 1987);(Mccrae et al., 1992);(Connor, 2002);(Digman, 1989)
Children	(Vicent et al., 2019)
Fitness	(Scoffier-Mériaux et al., 2015)
Health	(Hampson et al., 2016)
Job performance	(Salgado, 2002);(Lado & Alonso, 2017)
Academic performance	(Digman, 1989);(Kelsen & Liang, 2019);(Komarraju et al., 2011);(Komarraju et al., 2009);(Clark & Schroth, 2010)
Politics	(Weinschenk, 2017);(Aidt & Rauh, 2018)
Positive and negative affect	(Bruck & Allen, 2003);(Rzeszutek, Oniszczenko, & Gruszczyńska, 2019);(Zhai, Willis, O'Shea, Zhai, & Yang, 2013)
Product design	(Myszkowski & Storme, 2012);
Risk taking	(Lauriola & Levin, 2001)
Organizational citizenship	(ORGAN & RYAN, 1995);(K. Kumar, Bakhshi, & Rani, 2009);(Elanain, 2007)

Table 1 Summary of domains covered by researchers interested in the Big Five (not exhaustive).

Method

Sample and Data Collection

Data was collected from students. This work being a cross-validation study, the results from the traditional Big Five inventory, the IBM Watson Personality Insights service, Indico, and Personality Recognizer were compared.

Following is the description of the above list of Big Five assessments. Indico is an artificial intelligence company. It provides services that help its subscribers who demand solutions for projects requiring technical skills, synchronization between data scientists and businesses, selecting the appropriate use cases, using suitable solutions for unstructured data. Indico also provides predictive services for image analysis as well as text analysis. Personality Recognizer also predicts the Big Five traits based on text which is the essays written by the students in this article. The IBM Watson Personality Insights service is similar to the two previous services in a sense that it also predicts the Big Five traits scores based on text.

Students were asked to fill out a Big Five questionnaire. That questionnaire is a small version of the Goldberg's unipolar big-five markers (Saucier, 1994). It is composed of 40 items describing the Big Five personality traits. That instrument also uses a Likert scale from 1 to 5 with 1 being "very inaccurate" and 5 being "very accurate."

The second data collection is that of short essays written by the same subjects who filled out the Big Five questionnaire. The students were asked to write about their real-life experience. The reason for that choice of real-life experience was for the students to be able to express their true feelings while telling their personal experience. With that, the predictive services would be able to grasp the true personality traits scores. The students were asked to write at least 1200 words. The reason for that number is that the IBM Watson Personality Insights service reaches its optimal predicting performance at 1200 words.

The subjects received $10 (each) for completing the survey. They had the choice to withdraw from the survey if they wanted to except that they would not be able to receive the compensation in such a case. They were also reassured that their data would be kept confident. They were each given a random number between 1 and 300 at the beginning of the survey session. That random number was used as their identification for the survey. In addition, we made sure to choose the option not for the text analytics services to use the essays of the subjects while using the application programming interfaces (APIs). Both Big Five traditional questionnaire and writings instructions were given through Qualtrics.

Two hundred sixty-nine responses were collected. Eighteen of them were not used in the final analysis due to reasons such as insufficient number (less than 1200) of words in each essay, age (less than 18), extreme outliers (explained later in this study). 54.1% of the subjects were male and 45.9% were female. The age range was from 18 to 44 with an average of 21. 91.45% of the

subjects were single, 6.32% were married, 0.37% were separated, 1.86% were divorced. Those completing the associate degree represented 3.72% of the total, those completing the bachelor's degree represented 88.85% of the total, those completing the master's degree represented 5.58%, and those working on the PhD represented 1.86% of the total. The students who were employed represented 40.1% and those who were not employed represented 59.85%. Among the employed subjects, 46.30% had been employed for less than a year; 50% had been between 1 and 5 years; 1.85% had been between 6 and 10 years; 0.93% had been between 11 and 15 years; and 0.93% had been for 15 and more years. Still among the employed subjects, 21.30% were full-time employees, 77.78% were part-time employees, and 0.93% were contractors. Concerning the salary, 76.85% of the employed subjects were earning less than $25,000 per year; 16.67% were earning between $25,000 and $50,000 per year; 4.63% were earning between $51,000 and $75,000 per year; 0.93% were earning between $76,000 and $100,000; and 0.93% were earning more than $100,000. Again, among the employed subjects, 7.41% were in upper management, 11.11% were in middle management, 11.11% were in lower management, and 70.37% were in non-management.

Demographic Information on the participants	
Category	Frequency
Gender	Male: 54.1%
	Female: 45.90%
Average Age	21
Marital Status	Single: 91.45%
	Married: 6.32%
	Separated: 0.37%
	Divorced: 1.86%
	Widowed: 0%
Education	Associate: 3.72%
	Bachelor: 88.85%
	Master: 5.58%
	PhD: 1.86%
Employment status	Yes: 40.1

	No: 59.85%
Employment Status	Full-time: 21.30%
	Part-time: 77.78%
	Contractor: 0.93%
Salary	<$25K: 76.85%
	$25-50K: 16.67%
	$51-75K: 4.63%
	$76-100K: 0.93%
	>$100K: 0.93%
Managerial role	Non-management: 70.37%
	Lower management: 11.11%
	Middle management: 11.11%
	Upper management: 7.41%
Percentages are estimated approximatively	

Table 2 Demographics

Statistical method

The following table is from (Hair, Black, Babin, & Anderson, 2006).

Number of Groups	One	Two or More
Two Groups	t-test	Hotelling's T2
Two or More Groups	ANOVA	Multivariate Analysis of Variance (MANOVA)

Table 3 Methods depending on the number of groups

The statistical method deemed appropriate for this study was ANOVA. "Analysis of variance (ANOVA) is a statistical technique used to determine whether samples from two or more groups come from populations with equal means (i.e., Do the group means differ significantly?). Analysis of variance examines one dependent measure, whereas multivariate analysis of variance compares group differences on two or more dependent variables" (Hair et al., 2006, p. 384). Since the focus of this study is to compare Big Five scores from the different assessments, we opted for ANOVA. To be more specific in this study, there are four assessments that could be considered as groups. The first group of Big Five scores corresponds to the output of the IBM Watson Personality Insights service. The second group corresponds to the scores from the traditional Big Five questionnaire. The third group corresponds to the Big Five scores predicted

by Indico. The fourth group corresponds to the Big Five scores predicted by Personality Recognizer. Since the purpose of this article is to compare the results from the four assessments, the subjects are to be the same. In other words, if student A is a subject, student A would complete the traditional Big Five questionnaire and would have a score on each of the Big Five (Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism/Emotional Stability). In addition, based on the real-life experience essay of student A, three sets of Big Five scores would be predicted by Indico, IBM Watson Personality Insights, and Personality Recognizer. Then the four scores of student A from the assessments would be compared. This comparison means that the four Openness scores would be compared; the four conscientiousness scores would be compared; the four extraversion scores would be compared; the four agreeableness scores would be compared; the four neuroticism scores would also be compared. Since that comparison is applied to the same group of subjects, the method used was the repeated value ANOVA. A repeated measures ANOVA is used to compare three or more group means where the subjects in each group are the same. ("One-way ANOVA with repeated measures in SPSS Statistics - Step-by-step procedure including assumptions.," n.d.).

The computation of the scores was not explained in the documentation of some services such as that of IBM Watson Personality Insights and Indico. Moreover, the scores from the assessments were on different scales. The scores provided by IBM Watson Personality Insights and Indico were between 0 and 1. The scores from Personality Recognizer were between 1 and 7. The scores from the traditional Big Five instrument were between 1 and 5. Moreover, IBM explained that the raw scores provided by its service could be normalized to the need of the principal investigator. (https://console.bluemix.net/docs/services/personality-

insights/numeric.html#numeric). The latter can also normalize the data as he sees fit [3](IBM, n.d.). For those reasons of different scales and possibilities to normalize scores to fit the needs of the research, we had to proceed with rescaling all the scores so that they are comparable. Consequently, we used min/max scaler as it is a rescaling technique widely used in data science to have a scale between 0 and 1.

Min/Max scaler : $X' = \frac{X_1 - X_{min}}{X_{max} - X_{min}}$

Some assumptions had to be met in order to resume with repeated measures ANOVA. Those assumptions are that the dependent variables should be continuous; the independent variable should be composed of "related groups" ("One-way ANOVA with repeated measures in SPSS Statistics - Step-by-step procedure including assumptions.," n.d.) or "matched pairs" ("One-way ANOVA with repeated measures in SPSS Statistics - Step-by-step procedure including assumptions.," n.d.); there should not be any outliers; the dependent variable should be normally distributed; and the assumption of sphericity should also not be violated.

The first assumption is not violated because the scores of the Big Five (openness, conscientiousness, extraversion, agreeableness, and neuroticism) from the four assessments (Indico, traditional Big Five questionnaire, IBM Watson Personality Insights, Personality Recognizer) which are our dependent variables are continuous between 0 and 1.

Regarding the second assumption, it is not violated as we have related groups. Our subjects tested with Indico are the same tested with the traditional Big Five questionnaire, IBM Watson Personality Insights, and Personality Recognizer.

[3] See https://console.bluemix.net/docs/services/personality-insights/numeric.html#numeric

Concerning the third assumption which is that of the outliers, there were five extreme outliers which were removed. As seen in Appendix E (Figures 1-6), the box plots showed the extreme outliers. There was one extreme outlier (corresponding to row 38 in the dataset) among the IBM Watson Personality Insights points on agreeableness (Figure 1). There were two extreme outliers (rows 74 and 188) among the scores for extraversion, agreeableness, and conscientiousness from Personality Recognizer (Figure 2). There was also an extreme outlier (row 13) among the scores of openness from Personality Recognizer (Figure 5). There was also an extreme outlier (row 26) among the scores of openness from the traditional questionnaire (Figure 6).

Concerning the fourth assumption on normality, as seen in Table 4, in the case of the IBM Watson Personality Insights, it was violated for openness (Shapiro-Wilk p value = 0.006); in the case of Personality Recognizer, the assumption was violated for all the Big Five except emotional stability (which is opposite to neuroticism with Shapiro-Wilk p value = 0.265); in the case of the traditional Big Five questionnaire, the assumption was violated for all the Big Five except for extraversion (Shapiro-Wilk p value = 0.156) and emotional stability (Shapiro-Wilk p value = 0.265); in the case of Indico (the service did not provide output scores for neuroticism), the distribution was normal only for agreeableness (Shapiro-Wilk p value = 0.069) and openness (Shapiro-Wilk p value = 0.698). It is also important to stress the fact that all tests provided in this study after that of the outliers were run after having removed the five extreme outliers (mentioned above).

Regarding the sphericity assumption, the Mauchly's Test of Sphericity was run. The assumption was violated for all the Big Five. As seen in Appendix F (Tables 5-9), the p values were all 0.000.

Since the sphericity assumption was violated for the Big Five, an alternative to see if the mean scores are statistically significantly different is the Greenhouse-Geisser segment of our output ("One-way ANOVA with repeated measures in SPSS Statistics - Understanding and reporting the output.," n.d.). That segment is discussed in the result section.

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
MMSWopen	.052	251	.200*	.984	251	.006
MMSWconsc	.043	251	.200*	.990	251	.088
MMSWextr	.039	251	.200*	.997	251	.860
MMSWagree	.053	251	.081	.992	251	.196
MMSWneur	.040	251	.200*	.993	251	.261
MMSWemotstab	.040	251	.200*	.993	251	.261
MMSRecoExtra	.066	251	.011	.974	251	.000
MMSRecoEmoti	.055	251	.067	.993	251	.265
MMSRecoAgree	.061	251	.025	.977	251	.000
MMSRecoConsc	.076	251	.001	.983	251	.005
MMSRecoOpenn	.054	251	.069	.987	251	.021
MMSTOpen	.090	251	.000	.979	251	.001
MMSTConsc	.078	251	.001	.987	251	.020
MMSTExtra	.056	251	.053	.992	251	.156
MMSTAgree	.081	251	.000	.974	251	.000
MMSTEmstab	.057	251	.049	.993	251	.265
MMSTNeur	.057	251	.049	.993	251	.265
MMSIagreeableness	.073	251	.003	.990	251	.069
MMSIconscientiousness	.070	251	.004	.968	251	.000
MMSIextraversion	.045	251	.200*	.983	251	.005
MMSIopenness	.032	251	.200*	.996	251	.698

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Table 4 Normality Tests

The prefix "MMS" means Min/Max Scaler.

"W" following MMS means Watson from IBM Watson Personality Insights.

"Reco" following MMS means Personality Recognizer.

"T" following MMS means Traditional questionnaire.

"I" following MMS means Indico.

Results

This section discusses the results of our study. However, we only present the results tables for openness (Tables 10-13). The results tables for the other four of the Big Five personality traits are in Appendix G (containing Tables 14-29).

Based on the Greenhouse-Geisser correction (Table 11), the mean scores for openness were significantly different with $p = 0.000$. It signifies that there is significance in means for openness.

Based on the pairwise comparison (Table 13) and the within subject factors (Table 12), there was significant difference in openness between IBM Watson Personality Insights and Personality Recognizer ($p = 0.000$), between IBM Watson Personality Insights and the traditional Big Five instrument ($p = 0.000$), between IBM Watson Personality Insights and Indico ($p = 0.000$), between Personality Recognizer and the traditional Big Five instrument, and between the traditional Big Five instrument and Indico ($p = 0.000$). However, there was not a significant difference between Personality Recognizer and Indico ($p = 0.346$ which is greater than 0.05).

Based on the Greenhouse-Geisser correction (Table 15), the mean scores for conscientiousness were also significantly different with $p = 0.000$. It means that there is overall significance in means for conscientiousness.

Based on the pairwise comparison (Table 17) and the within subject factors (Table 16), there was significant difference in conscientiousness between IBM Watson Personality Insights and Personality Recognizer ($p = 0.000$), between IBM Watson Personality Insights and the traditional Big Five instrument ($p= 0.000$), between IBM Watson Personality Insights and Indico ($p = 0.000$), between Personality Recognizer and the traditional Big Five instrument ($p = 0.000$), between Personality Recognizer and Indico ($p = 0.000$), and between the traditional Big Five instrument and Indico ($p = 0.000$).

The mean scores for extraversion were also significantly different based on the Greenhouse-Geisser correction (Table 19) with $p = 0.000$; which means that there is significance in means for extraversion.

Based on the pairwise comparison (Table 21) and the within subject factors (Table 20), there was significant difference in extraversion between IBM Watson Personality Insights and Personality Recognizer ($p = 0.000$), between IBM Watson Personality Insights and Indico ($p = 0.000$), between Personality Recognizer and the traditional Big Five instrument ($p < 0.05$), and between Personality Recognizer and Indico ($p = 0.000$), and between the traditional Big Five instrument and Indico ($p = 0.000$). However, there was no significant difference between IBM Watson Personality Insights and the traditional Big Five instrument ($p = 1.000$ which is greater than 0.05).

With the Greenhouse-Geisser correction (Table 23), the mean scores for agreeableness were significantly different ($p = 0.000$). It signifies that there is overall significance in means for agreeableness.

Based on the pairwise comparison (Table 25) and the within subject factors (Table 24), there was significant difference in agreeableness between IBM Watson Personality Insights and Personality Recognizer ($p = 0.000$), between IBM Watson Personality Insights and the traditional Big Five instrument ($p= 0.005$), between IBM Watson Personality Insights and Indico ($p = 0.000$), between Personality Recognizer and the traditional Big Five instrument ($p = 0.000$), between Personality Recognizer and Indico ($p = 0.000$), and between the traditional Big Five instrument and Indico ($p = 0.000$).

The mean scores for emotional stability were also significantly different based on the Greenhouse-Geisser correction (Table 27) with p = 0.000. There is overall significance in means for emotional stability as a result

Based on the pairwise comparison (Table 29) and the within subject factors (Table 28), there was significant difference in emotional stability between IBM Watson Personality Insights and Personality Recognizer (p = 0.005 and is smaller than 0.05), between IBM Watson Personality Insights and the traditional Big Five instrument (p<0.05), between Personality Recognizer and the traditional Big Five instrument (p = 0.003 and is smaller than 0.05).

Openness

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
BigFiveAssessments	Pillai's Trace	.668	166.499[b]	3.000	248.000	.000	.668
	Wilks' Lambda	.332	166.499[b]	3.000	248.000	.000	.668
	Hotelling's Trace	2.014	166.499[b]	3.000	248.000	.000	.668
	Roy's Largest Root	2.014	166.499[b]	3.000	248.000	.000	.668
BigFiveAssessments * LeveloflV	Pillai's Trace	.000	.[b]	.000	.000	.	.
	Wilks' Lambda	1.000	.[b]	.000	249.000	.	.
	Hotelling's Trace	.000	.[b]	.000	2.000	.	.
	Roy's Largest Root	.000	.000[b]	3.000	247.000	1.000	.000

Table 10 Multivariate tests for openness

Tests of Within-Subjects Effects

Measure: Openness

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
BigFiveAssessments	Sphericity Assumed	9.722	3	3.241	140.308	.000	.359
	Greenhouse-Geisser	9.722	2.584	3.762	140.308	.000	.359
	Huynh-Feldt	9.722	2.614	3.720	140.308	.000	.359
	Lower-bound	9.722	1.000	9.722	140.308	.000	.359
BigFiveAssessments * LeveloflV	Sphericity Assumed	.000	0	.	.	.	.000
	Greenhouse-Geisser	.000	.000	.	.	.	.000
	Huynh-Feldt	.000	.000	.	.	.	.000
	Lower-bound	.000	.000	.	.	.	.000
Error (BigFiveAssessments)	Sphericity Assumed	17.323	750	.023			
	Greenhouse-Geisser	17.323	646.078	.027			
	Huynh-Feldt	17.323	653.417	.027			
	Lower-bound	17.323	250.000	.069			

Table 11 Test of Within-Subjects Effects for openness

Within-Subjects Factors

Measure: Openness

BigFiveAssessments	Dependent Variable
1	MMSWopen
2	MMSRecoOpenn
3	MMSTOpen
4	MMSIopenness

Table 12 Within-Subjects Factors for openness

MMSWopen: Min/Max Scaler (IBM Watson Personality Insights) (openness)

MMSRecoOpenn: Min/Max Scaler (Personality Recognizer) (openness)

MMSTOpen: Min/Max Scaler (Traditional questionnaire) (openness)

MMSIopenness: Min/Max Scaler (Indico) (openness)

Pairwise Comparisons

Measure: Openness

(I) BigFiveAssessments	(J) BigFiveAssessments	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]	
					Lower Bound	Upper Bound
1	2	-.127*	.013	.000	-.161	-.093
	3	-.275*	.013	.000	-.310	-.241
	4	-.102*	.017	.000	-.146	-.058
2	1	.127*	.013	.000	.093	.161
	3	-.148*	.010	.000	-.176	-.121
	4	.025	.013	.346	-.010	.060
3	1	.275*	.013	.000	.241	.310
	2	.148*	.010	.000	.121	.176
	4	.173*	.015	.000	.134	.213
4	1	.102*	.017	.000	.058	.146
	2	-.025	.013	.346	-.060	.010
	3	-.173*	.015	.000	-.213	-.134

Table 13 Pairwise Comparisons for openness

1: Min/Max Scaler (IBM Watson Personality Insight) (openness)

2: Min/Max Scaler (Personality Recognizer) (openness)

3: Min/Max Scaler (Traditional questionnaire) (openness)

4: Min/Max Scaler (Indico) (openness)

Robustness tests

As a robustness test, both Friedman and Wilcoxon Signed Ranked tests were run. The reason was that those tests are nonparametric. They can be used in case of violated assumptions as in our case with both normality and sphericity. “The Friedman test compares the mean ranks between the related groups and indicates how the group differed.”(“Friedman Test in SPSS Statistics - How to run the procedure, understand the output using a relevant example | Laerd Statistics.,” n.d.). The Friedman test showed that there was significant difference among the mean rank for all the Big Five. In order to locate where the difference occurred, Wilcoxon Signed Ranked test was run for all possible pairs of assessments (IBM Watson Personality

Insights, Personality Recognizer, traditional Big Five instrument, and Indico) for all the Big Five.

Results of the Robustness tests

In this section, we discuss and report the results for all the Big Five. However, we only present the results tables for openness (Tables 30-31). The results tables for the other four of the Big Five personality traits are in Appendix H (containing Tables 32-39).

The Friedman test result (Table 30) shows that there is significant difference among the mean ranks for openness. ($p = 0.00$). The Wilcoxon Signed Ranks test (Table 31) shows that there was significant difference among pairs except between Indico and Personality Recognizer ($p = 0.054$).

The Friedman test result (Table 32) shows that there is significant difference among the mean ranks for conscientiousness. ($p = 0.00$). The Wilcoxon Signed Ranks test (Table 33) showed that there was significant difference among pairs (all p values for the six pairs were smaller than 0.05).

The Friedman test result (Table 34) showed that there is significant difference among the mean ranks for extraversion. ($p = 0.00$). The Wilcoxon Signed Ranks test (Table 35) shows that there was significant difference among pairs except between the traditional Big Five instrument and IBM Watson Personality Insights ($p = 0.823$).

The Friedman test result (Table 36) showed that there was significant difference among the mean ranks for agreeableness. ($p = 0.00$). The Wilcoxon Signed Ranks test (Table 37) showed that there was significant difference among pairs (all p values for the six pairs were smaller than 0.05).

The Friedman test result (Table 38) shows that there is significant difference among the mean ranks for emotional stability. (p =0.00). The Wilcoxon Signed Ranks test (Table 39) showed that there was significant difference among pairs (all p values for the three pairs were smaller than 0.05).

The robustness tests confirm the results from the repeated measure ANOVA. Most of the Big Five assessments differ in mean ranks except between Traditional Questionnaire and Watson for extraversion and between Indico and Personality Recognizer for openness. Tables 40, 41, 42, 43, and 44 summarize the results for each of the traits (openness, conscientiousness, extraversion, agreeableness, and emotional stability respectively).

Openness

Test Statistics[a]

N	251
Chi-Square	277.771
df	3
Asymp. Sig.	.000

a. Friedman Test

Table 30 Friedman Test for openness

Test Statistics[a]

	MMSRecoOpenn - MMSWopen	MMSTOpen - MMSWopen	MMSIopenness - MMSWopen	MMSTOpen - MMSRecoOpenn	MMSIopenness - MMSRecoOpenn	MMSTOpen - MMSIopenness
Z	-8.710[b]	-12.911[b]	-5.934[b]	-11.110[b]	-1.927[c]	-9.940[b]
Asymp. Sig. (2-tailed)	.000	.000	.000	.000	.054	.000

a. Wilcoxon Signed Ranks Test

b. Based on negative ranks.

c. Based on positive ranks.

Table 31 Test Statistics for openness

	IBM Watson Personality Insights	Personality Recognizer	Traditional Questionnaire	Indico
IBM Watson Personality Insights	N/A	✗	✗	✗
Personality Recognizer	✗	N/A	✗	✓
Traditional Questionnaire	✗	✗	N/A	✗
Indico	✗	✓	✗	N/A
Openness ✗: Significant difference among means ✓: No significant difference among means				

Table 40 Summary of comparison among the assessments for openness

	IBM Watson Personality Insights	Personality Recognizer	Traditional Questionnaire	Indico
IBM Watson Personality Insights	N/A	✗	✗	✗
Personality Recognizer	✗	N/A	✗	✗
Traditional Questionnaire	✗	✗	N/A	✗
Indico	✗	✗	✗	N/A
Conscientiousness ✗: Significant difference among means ✓: No significant difference among means				

Table 41 Summary of comparison among the assessments for conscientiousness

	IBM Watson Personality Insights	Personality Recognizer	Traditional Questionnaire	Indico
IBM Watson Personality Insights	N/A	✗	✓	✗
Personality Recognizer	✗	N/A	✗	✗

Traditional Questionnaire	✓	×	N/A	×
Indico	×	×	×	N/A
Extraversion ×: Significant difference among means ✓: No significant difference among means				

Table 42 Summary of comparison among the assessments for extraversion

	IBM Watson Personality Insights	Personality Recognizer	Traditional Questionnaire	Indico
IBM Watson Personality Insights	N/A	×	×	×
Personality Recognizer	×	N/A	×	×
Traditional Questionnaire	×	×	N/A	×
Indico	×	×	×	N/A
Agreeableness ×: Significant difference among means ✓: No significant difference among means				

Table 43 Summary of comparison among the assessments for agreeableness

	IBM Watson Personality Insights	Personality Recognizer	Traditional Questionnaire
IBM Watson Personality Insights	N/A	×	×
Personality Recognizer	×	N/A	×
Traditional Questionnaire	×	×	N/A
Emotional Stability ×: Significant difference among means ✓: No significant difference among means Indico did not provide scores for neuroticism/emotional stability			

Table 44 Summary of comparison among the assessments for emotional stability

Implications

The results of this study showed that there were significant differences among the different assessments types for the Big Five personality traits. It implies that each of the Big Five predicting services had different ways of going about the calculation of the scores. Some of the services such as Indico or IBM Watson Personality Insights, did not actually explain in great detail how the scores they provided were calculated. It might be due to the fact that all those predictive companies would not want to reveal much information for competitive reasons. It goes without saying that to provide their services to the public, those companies must have somewhat tested the accuracy and comprehensiveness of their predictions. Consequently, finding significant difference among the different assessment types for the Big Five does not necessary mean that some of them are wrong and have erroneous calculation of the Big Five scores. It may rather mean that some of them might be better at predicting the Big Five scores than others.

Our findings provide different options to both researchers and practitioners who are interested in using those text analytics services to predict the Big Five personality traits.

At the academic level, both Personality Recognizer and IBM Watson Personality Insights services could be suggested. Regarding Personality Recognizer, the reason is that its outputs are in 7-point Likert scale. Many instruments are measured using the 5 or 7-point Likert scale. It would be therefore beneficial for researchers to use the Personality Recognizer if the other constructs they study are also measured with that same scale. That would permit them to have measures based on a common scale for consistency. Researchers finding it convenient to use scores between 0 and 1 could use IBM Watson Personality Insights service as it provides the same score range. Indico, in that case, seems to be the least to use among the three Big Five

predictive services. The reason is that it did not provide scores for emotional stability/neuroticism. It only provided the scores of the other four traits.

Based on our statistical results, IBM Watson Personality Insights could be considered the service with the highest priority to be used. The reason is that our results show that it is somewhat similar to the traditional questionnaire for the prediction of extraversion. Researchers who are only interested in extraversion, could use the IBM Watson Personality Insights as a result. Those only interested in openness, based on our findings, could use either Personality Recognizer or Indico. Both services showed similarity in our findings compared to IBM Watson Personality Insights and the traditional questionnaire which were all different from each other.

Our results did not show any similarities for all Big Five between the same assessment types. For example, similarity was found between Indico and Personality Recognizer for openness. It would let some researchers perplexed since that similarity is not present for conscientiousness, extraversion, agreeableness, and neuroticism/ emotional stability. However, it is necessary to understand that some research is conducted only on either of the Big Five personality traits such as (Baer & Oldham, 2006; Deyoung, Quilty, Peterson, & Gray, 2014; Glisky, Tataryn, Tobias, Kihlstrom, & Mcconkey, 1991; Griffin & Hesketh, 2004) in the case of openness, (Barrick, Mount, & Strauss, 1993; Bogg & Roberts, 2004; B. W. Roberts, Lejuez, Krueger, Richards, & Hill, 2012; Robertson, Baron, Gibbons, Maciver, & Nyy, 2000) in the case of conscientiousness, (Isom-Schmidtke, Heller, & Schmidtke, 2004; Kandler, n.d.; Ong et al., 2010; Wolf & Ackerman, 2005) in the case of extraversion, (W. G. Graziano, Habashi, Sheese, & Tobin, 2007; W. G. Graziano et al., 2002; W. Graziano & Jensen-Campbell, 1996; Hirsh, Deyoung, Xu, & Peterson, 2010)in the case of agreeableness, and (Celli & Rossi, 2012; Judge & Bono, 2001; Li et al., n.d.; Teng, Chang, & Hsu, n.d.). For those types of one-targeted-personality-traits studies,

using either IBM Watson Personality Insights or Personality Recognizer could be more than appropriate if the target would be openness.

Limitations

A major limitation to this study was the fact that the scores provided by the different types of assessments did not have the same scale. The traditional Big Five instrument had a Likert scale from 1 to 5; the scores from Indico were between 0 and 1; the scores from Personality Recognizer were from 1 to 7; those of IBM Watson Personality Insight were between 0 and 1. The difference in scale led to the application of Min/max scaler so that all scores had the same scales for the comparison (Repeated measures ANOVA) to be executed.

Conclusion

This study dealt with testing how different or similar the Big Five scores provided by four different Big Five assessments (the traditional Big Five instrument, Indico, IBM Watson Personality Insights, and Personality Recognizer) were. Using repeated measures ANOVA, the results showed that there were significant differences among scores except for openness between Personality Recognizer and Indico and for extraversion between IBM Watson Personality Insights and the traditional Big Five instrument. Only between IBM Watson Personality Insights and the traditional Big Five instrument for extraversion and between Personality Recognizer and Indico for openness that there was no significant difference. If we regard the Traditional Big Five questionnaire as the assessment to compare to, based on its duration and usage in research (benchmark), we could say that IBM Watson Personality Insights would be the text analytic service with the better prediction of the Big Five personality traits. The reason is that only IBM Watson Personality Insights showed similarity with the Traditional Questionnaire for

extraversion. That is at a very small extent as the difference was still significant in the case of the other four of the Big Five traits. Deeper analyses may be needed to shed light on that as a result.

Appendix A: Survey on Demographics

Q1 Please indicate your Gender

□ Male

□ Female

Q2 Please write your age

Q3 What is your marital status?

□ Single, never married

□ Married

□ Seperated

□ Divorced

□ Widowed

Q4 What degree are you currently pursuing?

□ Associate's

□ Bachelor's

□ Master's

□ PhD

Q5 What is your current major?

Q6 Are you currently employed?

□ Yes

□ No

Q7 How many years have you been at this company?

□ Less than one year

□ 1-5 years

□ 6-10 years

□ 11-15 years

□ 15+ years

Q8 What is your position at this company?

Q9 Are you a full time or part time employee?

□ Full-time

□ Part-time

□ Contractor

Q10 Are you a management or non-management employee?

□ Upper Management

□ Middle Management

□ Lower Management

□ Non-management

Q11 Before taxes, what is your annual income?

□ Less than $25,000

□ $25,000-$50,000

□ $51,000-$75,000

□ $76,000-$100,000

□ $100,000+

Q12 What is the size of your department?

□ 1-10 employees

□ 11-20 employees

□ 21-30 employees

□ 31-40 employees

□ 40+ employees

Q13 What is the size of your company?

□ 1-250 employees

□ 250-500 employees

□ 500-750 employees

□ 750-1,000 employees

□ 1,000+ employees

Q14 What industry does your company belong too?

□ Telecommunications

□ Manufacturing

□ Banking/Finance

□ IT Consulting

□ Retail

□ Healthcare

□ Government (City, State or Federal)

□ Defense Firm (i.e. Lockheed Martin, Raytheon, etc.)

□ Education

□ Media

□ Other

Appendix B: Essay prompt

Directions

You are to provide an essay (written in a Word document) of at least 1200 words about your real-life experience (It could be anything you would like; bad experience, good experience, or both). You have to make sure that the level of English you are using is the regular one that you use in your daily life. The essay does not require any formal introduction, development, or conclusion. You can just separate each of your different entries by going to the next line. Your work should be single space, 0 point spacing before and after paragraphs. After essay completion, please verify that it has at least 1200 words (The number of words is located on bottom left side of the Word page), copy the essay, and then paste it into the provided cell from your Qualtrics survey.

N.B. Your essay should not contain your name (You will be asked to write your name in a separate question from the UTA Qualtrics surveys). Your name will strictly and only be used to match your responses from the first session survey (including the essay) and those from the second session survey. Except that matching step, your name will not have any other purpose.

Appendix C: IBM Watson Personality Insights service

Input requirement from subjects

The IBM service requires at least 1200 words and less than 3000 words for more precise results of its service. However, 600 words are considered enough for fair results. ((IBM, n.d.))(https://console.bluemix.net/docs/services/personality-insights/input.html#sufficient)

Following are the average mean absolute error and average correlation across all characteristics depending on the number of words used as input.

Number of words	Average MAE across all characteristics	Average correlation across all characteristics
3000	12.1%	0.257
1200	12.2%	0.237
600	12.3%	0.212
300	12.5%	0.175
100	12.7%	0.095

(IBM, n.d.)(https://console.bluemix.net/docs/services/personality-insights/input.html#sufficient)

Appendix D: Traditional Big Five Questionnaire

Please use the following list of common human traits to describe yourself as accurately as possible. Describe yourself as you see yourself at the present time, not as you wish to be in the future. Describe yourself as you are generally or typically, as compared with other persons you know of the same sex and of roughly the same age.

Please use the following rating scale to make your ratings on your paper:

Very Inaccurate	Moderately Inaccurate	Neither Accurate nor Inaccurate	Moderately Accurate	Very Accurate
(1)	(2)	(3)	(4)	(5)

1. Bashful_____
2. Bold_____
3. Careless_____
4. Cold_____
5. Complex_____
6. Cooperative_____
7. Creative_____
8. Deep_____
9. Disorganized_____
10. Efficient_____
11. Energetic_____
12. Envious_____
13. Extraverted_____
14. Fretful_____
15. Harsh_____
16. Imaginative_____
17. Inefficient_____
18. Intellectual_____
19. Jealous_____
20. Kind_____
21. Moody_____
22. Organized_____
23. Philosophical_____
24. Practical_____
25. Quiet_____
26. Relaxed_____
27. Rude_____
28. Shy_____
29. Sloppy_____
30. Sympathetic_____
31. Systematic_____
32. Talkative_____
33. Temperamental_____
34. Touchy_____
35. Uncreative_____
36. Unenvious_____
37. Unintellectual_____
38. Unsympathetic_____
39. Warm_____
40. Withdrawn_____

Appendix E: Box Plot

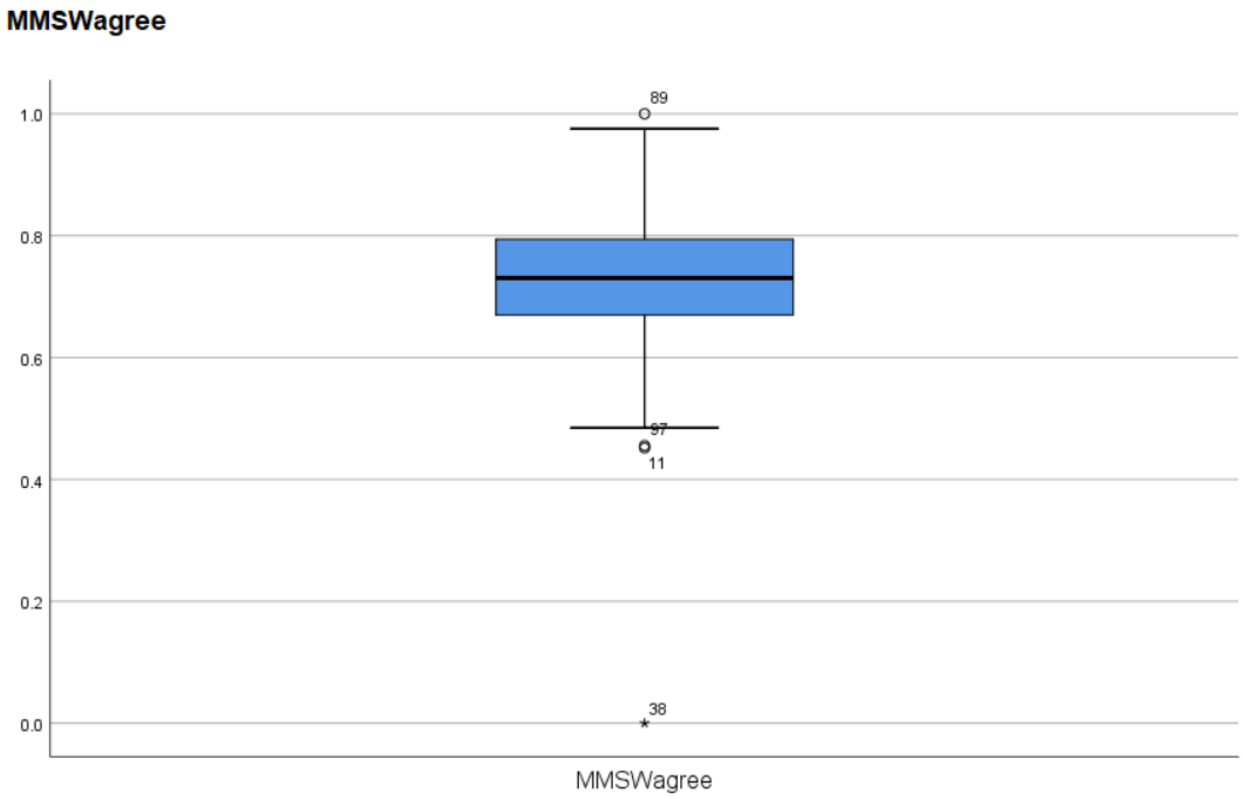

Figure 1 Box plot (Agreeableness from IBM Watson)

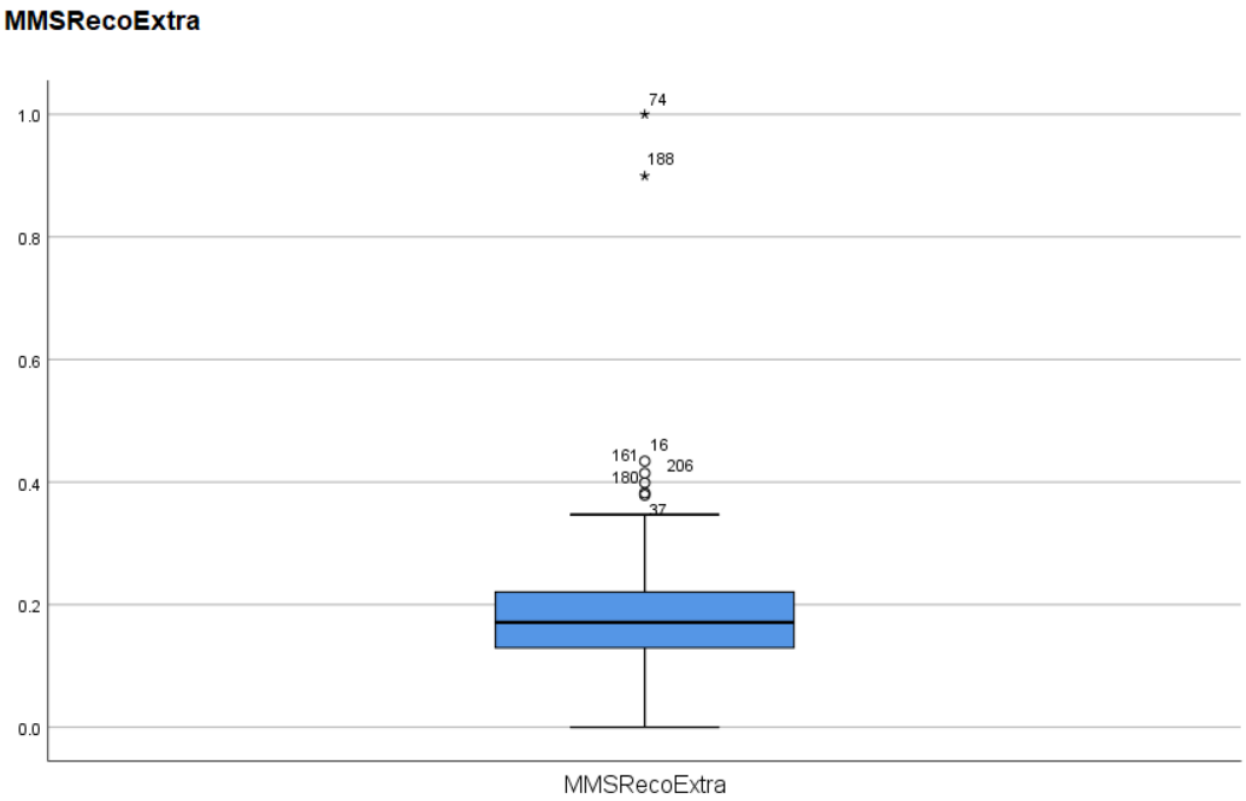

Figure 2 Box plot (Extraversion from Personality Recognizer)

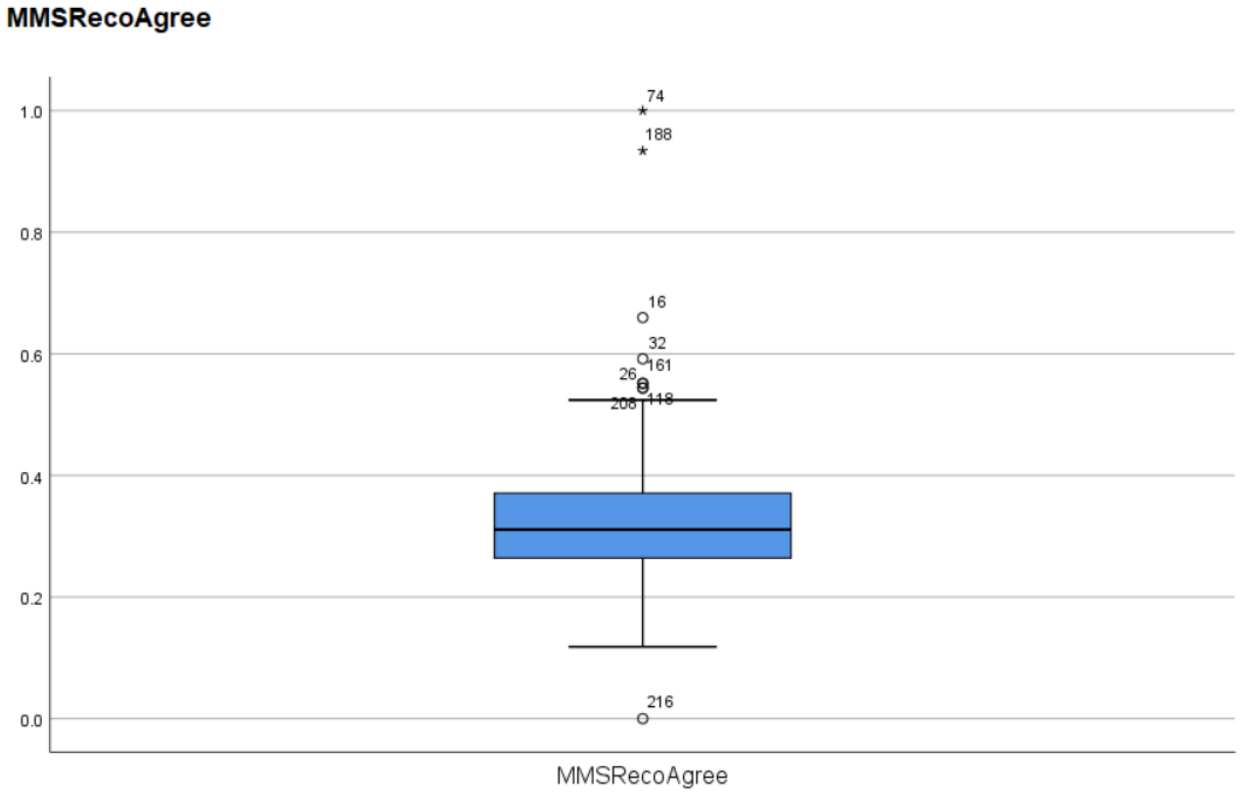

Figure 3 Box plot (Agreeableness from Personality Recognizer)

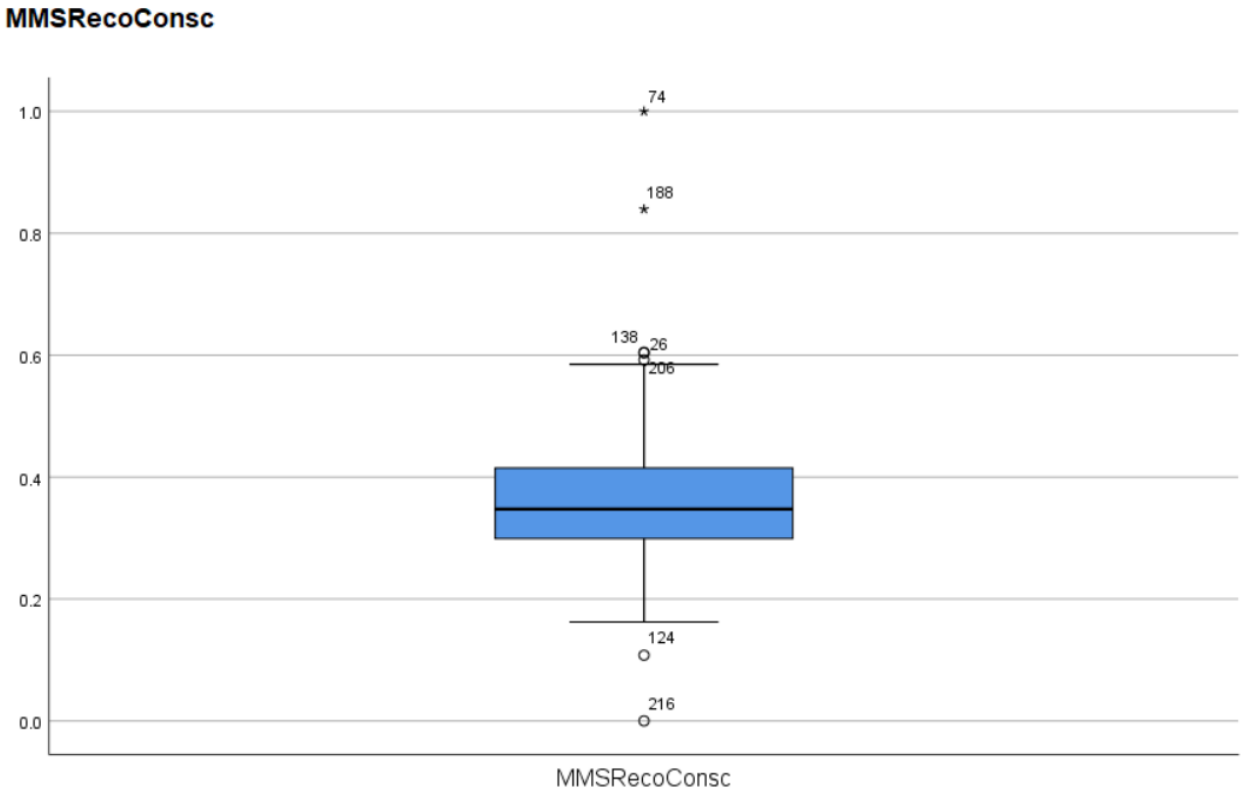

Figure 4 Box plot (Conscientiousness from Personality Recognizer)

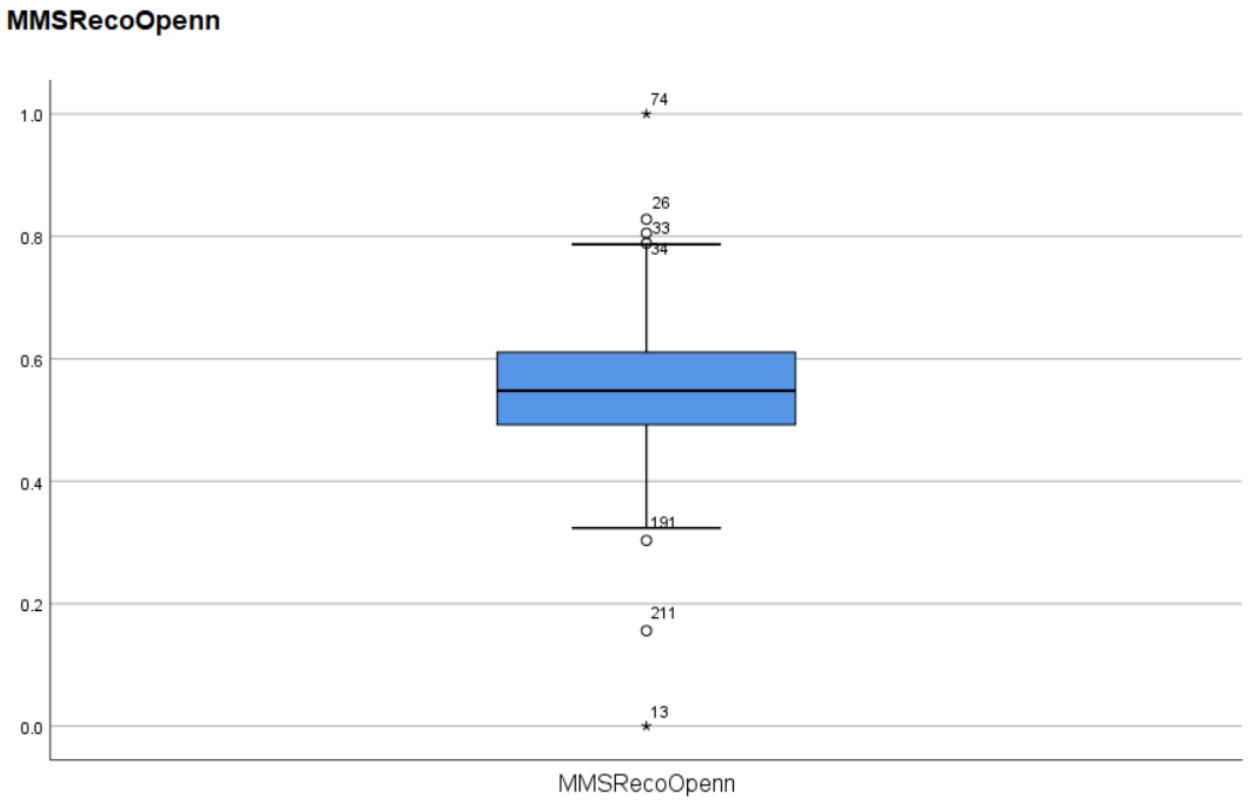

Figure 5 Box Plot (Openness from Personality Recognizer)

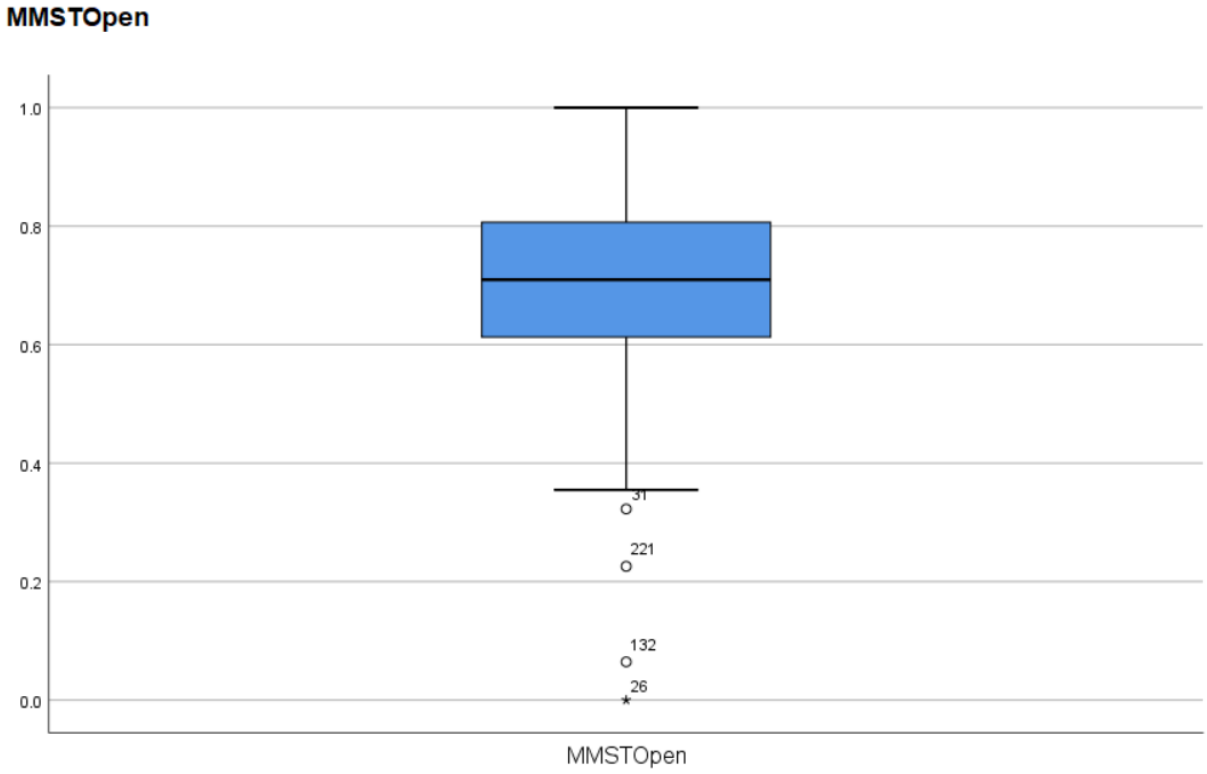

Figure 6 Box plot (Openness from Traditional questionnaire)

Appendix F: Mauchly's Tests of Sphericity

Mauchly's Test of Sphericity[a]

Measure: Openness

Within Subjects Effect	Mauchly's W	Approx. Chi-Square	df	Sig.	Epsilon[b] Greenhouse-Geisser	Epsilon[b] Huynh-Feldt	Epsilon[b] Lower-bound
BigFiveAssessments	.777	62.895	5	.000	.861	.871	.333

Table 5 Mauchly's Test of Sphericity for openness

Mauchly's Test of Sphericity[a]

Measure: Conscientiousness

Within Subjects Effect	Mauchly's W	Approx. Chi-Square	df	Sig.	Epsilon[b] Greenhouse-Geisser	Epsilon[b] Huynh-Feldt	Epsilon[b] Lower-bound
BigFiveAssessments	.693	91.063	5	.000	.853	.863	.333

Table 6 Mauchly's Test of Sphericity for conscientiousness

Mauchly's Test of Sphericity[a]

Measure: Extraversion

Within Subjects Effect	Mauchly's W	Approx. Chi-Square	df	Sig.	Epsilon[b] Greenhouse-Geisser	Epsilon[b] Huynh-Feldt	Epsilon[b] Lower-bound
BigFiveAssessments	.751	71.135	5	.000	.867	.877	.333

Table 7 Mauchly's Test of Sphericity for extraversion

Mauchly's Test of Sphericity[a]

Measure: Agreeableness

Within Subjects Effect	Mauchly's W	Approx. Chi-Square	df	Sig.	Epsilon[b] Greenhouse-Geisser	Epsilon[b] Huynh-Feldt	Epsilon[b] Lower-bound
BigFiveAssessments	.762	67.728	5	.000	.872	.882	.333

Table 8 Mauchly's Test of Sphericity for agreeableness

Mauchly's Test of Sphericity[a]

Measure: EmotionalStability

Within Subjects Effect	Mauchly's W	Approx. Chi-Square	df	Sig.	Epsilon[b]		
					Greenhouse-Geisser	Huynh-Feldt	Lower-bound
BigFiveAssessments	.973	6.929	2	.031	.973	.981	.500

Table 9 Mauchly's Test of Sphericity for emotional stability

Appendix G: Parametric Test Results

Conscientiousness

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
BigFiveAssessments	Pillai's Trace	.604	125.838[b]	3.000	248.000	.000	.604
	Wilks' Lambda	.396	125.838[b]	3.000	248.000	.000	.604
	Hotelling's Trace	1.522	125.838[b]	3.000	248.000	.000	.604
	Roy's Largest Root	1.522	125.838[b]	3.000	248.000	.000	.604
BigFiveAssessments * LeveloflV	Pillai's Trace	.000	.[b]	.000	.000	.	.
	Wilks' Lambda	1.000	.[b]	.000	249.000	.	.
	Hotelling's Trace	.000	.[b]	.000	2.000	.	.
	Roy's Largest Root	.000	.000[b]	3.000	247.000	1.000	.000

Table 14 Multivariate tests for conscientiousness

Tests of Within-Subjects Effects

Measure: Conscientiousness

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
BigFiveAssessments	Sphericity Assumed	12.695	3	4.232	151.832	.000	.378
	Greenhouse-Geisser	12.695	2.560	4.959	151.832	.000	.378
	Huynh-Feldt	12.695	2.589	4.904	151.832	.000	.378
	Lower-bound	12.695	1.000	12.695	151.832	.000	.378
BigFiveAssessments * LeveloflV	Sphericity Assumed	.000	0	.	.	.	.000
	Greenhouse-Geisser	.000	.000	.	.	.	.000
	Huynh-Feldt	.000	.000	.	.	.	.000
	Lower-bound	.000	.000	.	.	.	.000
Error (BigFiveAssessments)	Sphericity Assumed	20.904	750	.028			
	Greenhouse-Geisser	20.904	639.961	.033			
	Huynh-Feldt	20.904	647.148	.032			
	Lower-bound	20.904	250.000	.084			

Table 15 Tests of Within-Subjects Effects for conscientiousness

Within-Subjects Factors

Measure: Conscientiousness

BigFiveAssessments	Dependent Variable
1	MMSWconsc
2	MMSRecoConsc
3	MMSTConsc
4	MMSIconscientiousness

Table 16 Within-Subjects Factors (conscientiousness)

MMSWconsc: Min/Max Scaler (IBM Watson Personality Insight) (conscientiousness)

MMSRecoConsc: Min/Max Scaler (Personality Recognizer) (conscientiousness)

MMSTConsc: Min/Max Scaler (Traditional questionnaire) (conscientiousness)

MMSIconscientiousness; Min/Max Scaler (Indico) (conscientiousness)

Pairwise Comparisons

Measure: Conscientiousness

(I) BigFiveAssessments	(J) BigFiveAssessments	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]	
					Lower Bound	Upper Bound
1	2	.102*	.014	.000	.065	.140
	3	-.139*	.017	.000	-.184	-.093
	4	.156*	.017	.000	.112	.200
2	1	-.102*	.014	.000	-.140	-.065
	3	-.241*	.013	.000	-.277	-.205
	4	.054*	.011	.000	.026	.083
3	1	.139*	.017	.000	.093	.184
	2	.241*	.013	.000	.205	.277
	4	.295*	.016	.000	.251	.339
4	1	-.156*	.017	.000	-.200	-.112
	2	-.054*	.011	.000	-.083	-.026
	3	-.295*	.016	.000	-.339	-.251

Table 17 Pairwise comparisons for conscientiousness

1: Min/Max Scaler (IBM Watson Personality Insight) (conscientiousness)

2: Min/Max Scaler (Personality Recognizer) (conscientiousness)

3: Min/Max Scaler (Traditional questionnaire) (conscientiousness)

4: Min/Max Scaler (Indico) (conscientiousness)

Extraversion

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
BigFiveAssessments	Pillai's Trace	.914	874.111[b]	3.000	248.000	.000	.914
	Wilks' Lambda	.086	874.111[b]	3.000	248.000	.000	.914
	Hotelling's Trace	10.574	874.111[b]	3.000	248.000	.000	.914
	Roy's Largest Root	10.574	874.111[b]	3.000	248.000	.000	.914
BigFiveAssessments * LeveloflV	Pillai's Trace	.000	.[b]	.000	.000	.	.
	Wilks' Lambda	1.000	.[b]	.000	249.000	.	.
	Hotelling's Trace	.000	.[b]	.000	2.000	.	.
	Roy's Largest Root	.000	.000[b]	3.000	247.000	1.000	.000

Table 18 Multivariate tests for extraversion

Tests of Within-Subjects Effects

Measure: Extraversion

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
BigFiveAssessments	Sphericity Assumed	33.459	3	11.153	444.953	.000	.640
	Greenhouse-Geisser	33.459	2.602	12.859	444.953	.000	.640
	Huynh-Feldt	33.459	2.632	12.714	444.953	.000	.640
	Lower-bound	33.459	1.000	33.459	444.953	.000	.640
BigFiveAssessments * LeveloflV	Sphericity Assumed	.000	0	.	.	.	.000
	Greenhouse-Geisser	.000	.000	.	.	.	.000
	Huynh-Feldt	.000	.000	.	.	.	.000
	Lower-bound	.000	.000	.	.	.	.000
Error (BigFiveAssessments)	Sphericity Assumed	18.799	750	.025			
	Greenhouse-Geisser	18.799	650.479	.029			
	Huynh-Feldt	18.799	657.929	.029			
	Lower-bound	18.799	250.000	.075			

Table 19 Tests of Within-Subjects Effects for extraversion

Within-Subjects Factors

Measure: Extraversion

BigFiveAssessments	Dependent Variable
1	MMSWextr
2	MMSRecoExtra
3	MMSTExtra
4	MMSIextraversion

Table 20 Within-Subjects Factors for extraversion

MMSWextr: Min/Max Scaler (IBM Watson Personality Insight) (extraversion)

MMSRecoExtra: Min/Max Scaler (Personality Recognizer) (extraversion)

MMSTExtra: Min/Max Scaler (Traditional questionnaire) (extraversion)

MMSIextraversion: Min/Max Scaler (Indico) (extraversion)

Pairwise Comparisons

Measure: Extraversion

(I) BigFiveAssessments	(J) BigFiveAssessments	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]	
					Lower Bound	Upper Bound
1	2	.353*	.011	.000	.322	.383
	3	-.002	.016	1.000	-.045	.041
	4	-.141*	.015	.000	-.180	-.102
2	1	-.353*	.011	.000	-.383	-.322
	3	-.354*	.014	.000	-.391	-.318
	4	-.494*	.011	.000	-.524	-.463
3	1	.002	.016	1.000	-.041	.045
	2	.354*	.014	.000	.318	.391
	4	-.139*	.016	.000	-.183	-.096
4	1	.141*	.015	.000	.102	.180
	2	.494*	.011	.000	.463	.524
	3	.139*	.016	.000	.096	.183

Table 21 Pairwise comparisons for extraversion

1: Min/Max Scaler (IBM Watson Personality Insight) (extraversion)

2: Min/Max Scaler (Personality Recognizer) (extraversion)

3: Min/Max Scaler (Traditional questionnaire) (extraversion)

4: Min/Max Scaler (Indico) (extraversion)

Agreeableness

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
BigFiveAssessments	Pillai's Trace	.907	803.048[b]	3.000	248.000	.000	.907
	Wilks' Lambda	.093	803.048[b]	3.000	248.000	.000	.907
	Hotelling's Trace	9.714	803.048[b]	3.000	248.000	.000	.907
	Roy's Largest Root	9.714	803.048[b]	3.000	248.000	.000	.907
BigFiveAssessments * LeveloflV	Pillai's Trace	.000	.[b]	.000	.000	.	.
	Wilks' Lambda	1.000	.[b]	.000	249.000	.	.
	Hotelling's Trace	.000	.[b]	.000	2.000	.	.
	Roy's Largest Root	.000	.000[b]	3.000	247.000	1.000	.000

Table 22 Multivariate tests for agreeableness

Tests of Within-Subjects Effects

Measure: Agreeableness

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
BigFiveAssessments	Sphericity Assumed	25.906	3	8.635	439.098	.000	.637
	Greenhouse-Geisser	25.906	2.616	9.904	439.098	.000	.637
	Huynh-Feldt	25.906	2.646	9.791	439.098	.000	.637
	Lower-bound	25.906	1.000	25.906	439.098	.000	.637
BigFiveAssessments * LeveloflV	Sphericity Assumed	.000	0	.	.	.	.000
	Greenhouse-Geisser	.000	.000	.	.	.	.000
	Huynh-Feldt	.000	.000	.	.	.	.000
	Lower-bound	.000	.000	.	.	.	.000
Error (BigFiveAssessments)	Sphericity Assumed	14.749	750	.020			
	Greenhouse-Geisser	14.749	653.902	.023			
	Huynh-Feldt	14.749	661.438	.022			
	Lower-bound	14.749	250.000	.059			

Table 23 Tests of Within-Subjects Effects for agreeableness

Within-Subjects Factors

Measure: Agreeableness

BigFiveAssessments	Dependent Variable
1	MMSWagree
2	MMSRecoAgree
3	MMSTAgree
4	MMSIagreeableness

Table 24 Within-Subjects Factors

MMSWagree: Min/Max Scaler (IBM Watson Personality Insight) (agreeableness)

MMSRecoAgree: Min/Max Scaler (Personality Recognizer) (agreeableness)

MMSTAgree: Min/Max Scaler (Traditional questionnaire) (agreeableness)

MMSIagreeableness: Min/Max Scaler (Indico) (agreeableness)

Pairwise Comparisons

Measure: Agreeableness

(I) BigFiveAssessments	(J) BigFiveAssessments	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]	
					Lower Bound	Upper Bound
1	2	.414*	.009	.000	.390	.437
	3	.045*	.013	.005	.010	.080
	4	.162*	.013	.000	.129	.196
2	1	-.414*	.009	.000	-.437	-.390
	3	-.369*	.013	.000	-.403	-.335
	4	-.251*	.012	.000	-.283	-.220
3	1	-.045*	.013	.005	-.080	-.010
	2	.369*	.013	.000	.335	.403
	4	.117*	.015	.000	.078	.157
4	1	-.162*	.013	.000	-.196	-.129
	2	.251*	.012	.000	.220	.283
	3	-.117*	.015	.000	-.157	-.078

Table 25 Pairwise comparisons for agreeableness

1: Min/Max Scaler (IBM Watson Personality Insight) (agreeableness)

2: Min/Max Scaler (Personality Recognizer) (agreeableness)

3: Min/Max Scaler (Traditional questionnaire) (agreeableness)

4: Min/Max Scaler (Indico) (agreeableness)

Emotional Stability

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
BigFiveAssessments	Pillai's Trace	.123	17.419[b]	2.000	249.000	.000	.123
	Wilks' Lambda	.877	17.419[b]	2.000	249.000	.000	.123
	Hotelling's Trace	.140	17.419[b]	2.000	249.000	.000	.123
	Roy's Largest Root	.140	17.419[b]	2.000	249.000	.000	.123
BigFiveAssessments * LeveloflV	Pillai's Trace	.000	.[b]	.000	.000	.	.
	Wilks' Lambda	1.000	.[b]	.000	249.500	.	.
	Hotelling's Trace	.000	.[b]	.000	2.000	.	.
	Roy's Largest Root	.000	.000[b]	2.000	248.000	1.000	.000

Table 26 Multivariate Tests for emotional stability

Tests of Within-Subjects Effects

Measure: EmotionalStability

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
BigFiveAssessments	Sphericity Assumed	1.013	2	.506	19.916	.000	.074
	Greenhouse-Geisser	1.013	1.947	.520	19.916	.000	.074
	Huynh-Feldt	1.013	1.962	.516	19.916	.000	.074
	Lower-bound	1.013	1.000	1.013	19.916	.000	.074
BigFiveAssessments * LeveloflV	Sphericity Assumed	.000	0	.	.	.	.000
	Greenhouse-Geisser	.000	.000	.	.	.	.000
	Huynh-Feldt	.000	.000	.	.	.	.000
	Lower-bound	.000	.000	.	.	.	.000
Error (BigFiveAssessments)	Sphericity Assumed	12.711	500	.025			
	Greenhouse-Geisser	12.711	486.645	.026			
	Huynh-Feldt	12.711	490.410	.026			
	Lower-bound	12.711	250.000	.051			

Table 27 Tests of Within-Subjects Effects for emotional stability

.

Within-Subjects Factors

Measure: EmotionalStability

BigFiveAssessments	Dependent Variable
1	MMSWemotstab
2	MMSRecoEmoti
3	MMSTEmstab

Table 28 Within-Subjects Factors for emotional stability

MMSWemostab: Min/Max Scaler (IBM Watson Personality Insight) (emotional stability)

MMSRecoEmoti: Min/Max Scaler (Personality Recognizer) (emotional stability)

MMSTEmstab: Min/Max Scaler (Traditional questionnaire) (emotional stability)

Pairwise Comparisons

Measure: EmotionalStability

(I) BigFiveAssessments	(J) BigFiveAssessments	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]	
					Lower Bound	Upper Bound
1	2	-.042*	.013	.005	-.073	-.010
	3	-.090*	.015	.000	-.126	-.053
2	1	.042*	.013	.005	.010	.073
	3	-.048*	.014	.003	-.083	-.014
3	1	.090*	.015	.000	.053	.126
	2	.048*	.014	.003	.014	.083

Table 29

1: Min/Max Scaler (IBM Watson Personality Insight) (emotional stability)

2: Min/Max Scaler (Personality Recognizer) (emotional stability)

3: Min/Max Scaler (Traditional questionnaire) (emotional stability)

Appendix H: Nonparametric/Robustness Tests Results

Conscientiousness

Test Statistics[a]

N	251
Chi-Square	244.100
df	3
Asymp. Sig.	.000

a. Friedman Test

Table 32 Friedman test for conscientiousness

Test Statistics[a]

	MMSRecoConsc - MMSWconsc	MMSTConsc - MMSWconsc	MMSIconscientiousness - MMSWconsc	MMSTConsc - MMSRecoConsc	MMSIconscientiousness - MMSRecoConsc	MMSTConsc - MMSIconscientiousness
Z	-6.659[b]	-7.171[c]	-8.192[b]	-12.078[c]	-5.450[b]	-11.970[c]
Asymp. Sig. (2-tailed)	.000	.000	.000	.000	.000	.000

a. Wilcoxon Signed Ranks Test

b. Based on positive ranks.

c. Based on negative ranks.

Table 33 Test Statistics for conscientiousness

Extraversion

Test Statistics[a]

N	251
Chi-Square	461.285
df	3
Asymp. Sig.	.000

a. Friedman Test

Table 34 Friedman Test for extraversion

Test Statistics[a]

	MMSRecoExtra - MMSWextr	MMSTExtra - MMSWextr	MMSIextraversion - MMSWextr	MMSTExtra - MMSRecoExtra	MMSIextraversion - MMSRecoExtra	MMSTExtra - MMSIextraversion
Z	-13.686[b]	-.224[c]	-8.340[c]	-13.448[c]	-13.731[c]	-7.825[b]
Asymp. Sig. (2-tailed)	.000	.823	.000	.000	.000	.000

a. Wilcoxon Signed Ranks Test

b. Based on positive ranks.

c. Based on negative ranks.

Table 35 Test Statistics for extraversion

Agreeableness

Test Statistics[a]

N	251
Chi-Square	440.082
df	3
Asymp. Sig.	.000

a. Friedman Test

Table 36 Friedman test for agreeableness

Test Statistics[a]

	MMSRecoAgree - MMSWagree	MMSTAgree - MMSWagree	MMSIagreeableness - MMSWagree	MMSTAgree - MMSRecoAgree	MMSIagreeableness - MMSRecoAgree	MMSTAgree - MMSIagreeableness
Z	-13.734[b]	-2.710[b]	-10.483[b]	-13.534[c]	-12.813[c]	-7.045[c]
Asymp. Sig. (2-tailed)	.000	.007	.000	.000	.000	.000

a. Wilcoxon Signed Ranks Test

b. Based on positive ranks.

c. Based on negative ranks.

Table 37 Test Statistics for agreeableness

Emotional Stability

Test Statistics[a]

N	251
Chi-Square	30.845
df	2
Asymp. Sig.	.000

a. Friedman Test

Table 38 Friedman Test for Emotional Stability

Test Statistics[a]

	MMSRecoEmoti - MMSWemotstab	MMSTEmstab - MMSWemotstab	MMSRecoEmoti - MMSTEmstab
Z	-2.912[b]	-5.675[b]	-3.426[c]
Asymp. Sig. (2-tailed)	.004	.000	.001

a. Wilcoxon Signed Ranks Test

b. Based on negative ranks.

c. Based on positive ranks.

Table 39 Test Statistics for emotional stability

Chapter 3: Essay 2

Introduction/Background

Throughout one's lifetime, in a way or another, one happens to help others for various reasons. Thinking about helping, deciding to help, or doing so is a natural process that individuals experience most of the time. That is, in a nutshell, the definition of prosocial constructs which are prosocial moral reasoning and prosocial behavior.

Prosocial moral reasoning is the thought process executed while deciding whether or not to help others. Prosocial moral reasoning seems to have been considered a significant predictor of prosocial behavior. The latter denotes the act of helping. By logic, another construct (propensity to help) is also related to the concepts of prosocial moral reasoning as well as prosocial behavior. Both prosocial moral reasoning and prosocial behavior have been measured and validated by Carlo et al. (1992). Some researchers have borrowed the constructs presented by Carlo et al. (1992) and used propensity to help as a concept to represent prosocial behavior. In other words, this is to posit that both propensity to help and prosocial behavior could be used interchangeably.

Much research has been conducted on prosocial reasoning, prosocial behavior, or the combination of both (Carlo et al., 2011; Eisenberg-Berg & Hand, 1979; Gaesser, Keeler, & Young, 2018; Malti & Dys, 2018; Masten, Morelli, & Eisenberger, 2011; Silke, Brady, Boylan, & Dolan, 2018). For example, some researchers studied the relationship between prosocial reasoning and prosocial behavior. That is the case of Eisenberg-Berg & Hand (1979) who tried to study the relationship between preschoolers' moral reasoning and their altruism.

Other researchers focused on the potential predictors of prosocial behavior. That is the case of Carlo, Mestre, Samper, Tur, & Armenta (2010) who investigated on the connections or associations among concepts such as sympathy, perspective taking, prosocial behavior and

violent behavior in adolescents. Other researchers proposed mimicry (Kulesza, Dolinski, Huisman, & Majewski, 2014; Van Baaren, Holland, Kawakami, & Van Knippenberg, 2004), mood (George, 1991) or morality (De Groot & Steg, 2009) (to name a few) as antecedents of prosocial behavior. The large number of proposed antecedents explaining prosocial behavior shows how intricate humans are to the extent that there are many reasons for them to prosocially behave. Among all those reasons, it seems to us that personality has been quite modestly studied in relation to prosocial behavior. That is the reason why this current study comes to light.

In a general sense, one tends to relate personality to different types of behavior. In the same line of thinking, it would be beneficial to understand how personality, particularly the Big Five, would affect prosocial moral reasoning and propensity to help.

The Big Five is a composition of five different personality traits which are openness, conscientiousness, extraversion, agreeableness, and neuroticism/ emotional stability. This is our belief that each of those personality traits might affect prosocial moral reasoning and propensity to help. Thus, this current study tries to answer the following questions:

Does each of the Big Five predict prosocial moral reasoning?

Does each of the Big Five predict propensity to help?

Would there be any mediation effect of prosocial moral reasoning on the relationship between each of the Big Five and propensity to help?

Trying to answer those research questions will clarify which traits among the Big Five have a significant effect on predicting prosocial moral reasoning and propensity to help.

This study contributes to research on the Big Five and prosocial behavior. It uses Big Five scores inferred from text analytics services, which has not been done before (to our knowledge). Most of the research has been using the traditional Big Five questionnaire to assess the scores of the traits. This study could also be a contribution to prosocial behavior in in the marketing and the online domains for example.

Regarding the marketing domain, a lot of companies practice altruism marketing. They sacrifice enough of their budgets to create loyalty programs for their customers to keep them. Those companies do not have to do so. Rather, they are prosocially acting that way in the hope that they gain in the long run thanks to the customers who they attract and who stay loyal to them because of their programs or initiatives. The results of this study could explain, through personality, why members of the marketing department of those companies prosocially behave or show altruism towards their customers. This study could therefore be a benchmark for researchers trying to understand that marketing practice.

Concerning the online domains, there have been many cases of prosocial behavior. Sproull (2011) informed on the different appearances of prosocial behavior online. For example, the authors mention that people help by donating funds online, allowing their computer power to be used, dedicating time and effort in online groups, sharing knowledge for software development on online communities. The later is the case of online platforms in which subscribers may collaborate to work on projects or to compete for prizes. The results of this current study could also be beneficial to understand the reasons (at the personality level) why some of the online subscribers decide whether or not to help or to participate in collaborating task, or to just be passive.

The remainder of this study is structured as follows: through the literature review, we discuss and present the different research conducted on prosocial moral reasoning, prosocial behavior or propensity to help, and the Big Five personality traits; we then propose our hypotheses after using literature to support them; we then describe the methodology we used in this study from data collection, variable measurements, statistical methods to results report; we then continue with the discussion of the key findings and implications; and then complete the study with the conclusion and future research.

Literature Review

Big Five

The Big Five represents five personality traits which are agreeableness, conscientiousness, openness, introversion/extraversion, and neuroticism. The Big Five, also called Five-Factor model went through multiple analyses. For example, Connor (2002) confirmed its comprehensiveness in connection with popular personality inventories (PPI). The birth of the five traits has two origins which are the lexical origin and the questionnaire (Mccrae et al., 1992). Regarding the lexical origin, the work of Norman represents the commencement of the Five-Factor model (Norman, 1963). “The order in which these factors emerged roughly parallels their representation among English language trait terms in the dictionary” (Peabody & Goldberg, 1989). Concerning the questionnaire, the emergence of the “modern FFM” especially comes from H.J. Eysenck, “who identified Extraversion (E) and Neuroticism (N) as major components of psychological tests” (Norman, 1963). Later, Costa Jr & McCrae (1980) added Openness to Experience (O) and then “created scales to measure Agreeableness (A) and Conscientiousness

(C)" (Mccrae et al., 1992). The Five Factor Model, during its early stages, had to be validated. Its adoption in research had to be proved which is what McCrae & Costa (1987) did.

Research has been conducted on the Big Five and its relationship with prosocial behavior. For example, Afolabi (2013) studied the Big Five, gender differences, emotional intelligence and their relationship with undergraduates' prosocial behavior. The author finds that there is a positive and significant relationship between extraversion and conscientiousness and prosocial behavior.

Habashi, Graziano, & Hoover (2016) tried to pinpoint personality traits that affect prosocial behavior. Their key results is quite different from that of (Afolabi, 2013) in the extent that they found agreeableness to be affecting emotional reactions to those in need of assistance; which subsequently led to helping.

Xie, Chen, Lei, Xing, & Zhang (2016), in their study on the relationship between the Big Five and prosocial behavior and aggression, showed that except neuroticism, each of the Big Five were significantly related to prosocial behavior.

It is very true that research on Big Five and its relationship with prosocial behavior has already be done. However, the difference between this current and the previous ones is that the measures of the Big Five we used are based on personality-inferring-text-mining services; contrary to the other research using the traditional Big Five questionnaires. Another difference is that we use the construct of prosocial moral reasoning as mediator in the relationship.

Prosocial moral reasoning

Moral reasoning is defined as the ability to ""frame socio-moral problems using one's standards and values in order to judge the proper course of action"" (Rest, 2015)(page198). Prosocial moral reasoning (PMR) "is [also] a thought process involved in the decision whether or not to help, assist or take care of others in situations characterized by (1) difference in the interests or scope of the potential helper and of the people in need; and (2) minimal or absent external rules (Paciello, Fida, Cerniglia, Tramontano, & Cole, 2013). Eisenberg-Berg (1979), in a study on prosocial moral judgment of children, listed several types of reasoning (summarized in table 1): "Obsessive and/or magical view of authority and/or punishments" deals with the thought of receiving a sanction by something bigger than oneself if one does not act a certain way. "Hedonistic reasoning" deals with one's own fulfillment. It is subdivided into four parts. The first is the "pragmatic, hedonistic gain to the self" in which case one thinks about only oneself. The second is "direct reciprocity" in which one expects a reward in return if one decides to help. The third is "affectional relationship". It is related to the reasoning about the individual's attachment to the person in need of help. The fourth is "hedonistic pragmatism with a socially acceptable rationalization." In this subsection, the individual has hedonistic reasoning along with "unrealistic socially acceptable rationalizations". "Nonhedonistic pragmatism" is not about oneself, but more about the capability of the individual to be able to help or not. "Concern for others' needs (needs-oriented reasoning)" is subdivided into two parts which are the physical and the psychological need of the ones to be helped. "Reference to and concern with humanness;" is about the consideration that the ones who are in need of help are also human beings. "Stereotyped reasoning" is defined in three different parts. The first is the stereotype of what is supposed to be good or bad. The second is the stereotype of what is considered in general by the majority. The third is related to how others are stereotyped. "Approval and interpersonal

orientation;" is the consideration of what others would consider one's act to be good or not. "Overt empathic orientations;" is divided into two parts. The first one is about having sympathy for others. The second is about mentally putting oneself in the situation of the person in need of help. "Internalized affect;" is separated into four parts. The first is the positive affect due to the act of helping. The second is the positive affect because of one's own values. The third part is the negative affect due to the thought of not feeling good because of one's act. The fourth is about a bad feeling about oneself in case the wrong decision to help or not is made. "Other abstract and/or internalized types of reasoning" is divided into four parts. The first deals with following the rules and norms; the second is about respecting the rights of others; the third is about reciprocity among one another; the fourth one is about the good of the society. Those categories are not used in this study; however, a composite of them (explained in the Measures section) is used.

Reasoning categories	**Meaning in terms of consideration during the thinking process**	**Example**
"Obsessive and/or magical view of authority and/or punishments"	Receiving a sanction	"If I didn't help, someone would find out and punish me" (Eisenberg-Berg, 1979b)
"Hedonistic reasoning"	a) Thinking about oneself b) Expecting a reward in return c)Attachment to others d) combination of hedonism and out of the ordinary rationalization	a) "I wouldn't help because I might be watching my TV show" (Eisenberg-Berg, 1979b). b) "He'd help because they'd give him money the next time he needed it" (Eisenberg-Berg, 1979b) c) "He'd help because he might know some people in that place" (Eisenberg-Berg, 1979b) d) "He wouldn't help because then he could go to college and help more people some day" (Eisenberg-Berg, 1979b)

"Nonhedonistic pragmatism"	Own capabilities	"I'd help because I have the skills to do so" (Eisenberg-Berg, 1979b)
"Concern for others' needs (needs-oriented reasoning)"	a) physical need of others b) mental need of others	a) "He needs blood" (Eisenberg-Berg, 1979b) b) "They'd be happy if they had clean water" (Eisenberg-Berg, 1979b)
"Reference to and concern with humanness"	Humanity of others	"You'd help because they are human beings like you"
"Stereotypes of good or bad person"	a) what is supposed to be good or bad b) what is considered by the society in general c) how others are stereotyped	a) "a child would help because "it's nice."" (Eisenberg-Berg, 1979b) b) "It's only natural to help" (Eisenberg-Berg, 1979b) c) "I'd help because crippled kids are nice." (Eisenberg-Berg, 1979b)
"Approval and interpersonal orientation"	How others find that act to be (good or bad)	"My parents would be proud of me if I help." (Eisenberg-Berg, 1979b)
"Overt empathic orientations"	a) sympathy for others b) putting oneself in the situation of others	a) "I would feel sorry for him." (Eisenberg-Berg, 1979b) b) "I'm trying to put myself in his (or her) shoes." (Eisenberg-Berg, 1979b)
"Internalized affect"	a) positive affect from helping b) positive affect from one's values c)negative affect after a certain act d)culpability after a certain act	a) "I'd help because seeing her safe would make me feel good" (Eisenberg-Berg, 1979b) b) "I'd feel good because I had acted according to my values" (Eisenberg-Berg, 1979b) c) "I'd feel culpable because she was not safe" (Eisenberg-Berg, 1979b) d) "He'd (She'd) think badly of himself if he (she) didn't do the right thing" (Eisenberg-Berg, 1979b)
"Other abstract and/or internalized types of reasoning"	a) following rules and norms b) respecting the rights of others	a) "I have a commitment to help those in need" (Eisenberg-Berg, 1979b)

	c) reciprocity among one another d) the good of the society	b) "I'd help because her right to walk down the street was being violated" (Eisenberg-Berg, 1979b) c) "If everyone helps on another, we'd all be better off" (Eisenberg-Berg, 1979b). d) "If everyone helps, society would be a lot better" (Eisenberg-Berg, 1979b)

Table 1 (Summary of the reasoning categories) (Eisenberg-Berg, 1979b)

Prosocial behavior

Prosocial behavior "consists of a variety of acts such as helping, aiding, sharing, donating, or assisting" (Bar-Tal, 1976). That concept has been defined this way because the acts it encompasses have positive outcomes (Bar-Tal, 1976). A plethora of research has been conducted to investigate and propose antecedents of prosocial behavior.

Gratitude is one of the constructs proposed by researchers as predictor of prosocial behavior. Grant & Gino (2010) posited and confirmed that people being thanked for having helped tended to help more. The authors, based on the results of their study, stated that gratitude made the helpers feel socially valued, which increased their behaving prosocially.

Other authors used dispositional constructs such as affective reasoning, sympathy, and knowledge of currency as predictors of prosocial behavior of children. That is the case of Knight, Johnson, Carlo, & Eisenberg (1994) who found that children scoring high in those three variables donated more than their peers who scored low at the same variables.

Other research has been focusing on altruism and its effect on prosocial behavior (Lay & Hoppmann, 2015; Simpson & Willer, 2008; Stocks, Lishner, & Decker, 2009)(Stiff, Dillard, Somera, Kim, & Sleight, 1988). (Stocks et al. (2009), for example, tried to understand if the altruism of people (in the context of helping somebody suffering) is to suppress and suffering of

the person in need of help or rather to suppress this annoying feeling of seeing somebody who is suffering. They find that empathy plays a positive role in the altruistic behavior in order to diminish the suffering of the needy rather than one's own bad feeling of seeing the needy suffering. Simpson & Willer (2008) emphasized on those who proscocially behaved because they are altruist and those who do so their own advantage. They found that egoist individuals prosocially act for their reputation while the altruist individuals prosocially act regardless of reputation. Lay & Hoppmann (2015), in the encyclopedia of Geropsychology, listed and discussed antecedents of prosocial behavior such as altruism, empathy (W. Roberts & Strayer, 1996), kin selection, and generativity. In addition to both altruism and empathy, the authors explain that kin selection is the theory dealing with the fact that people decide to help other people they consider family members. They do so for their genes to survive or still continue to live. Regarding generativity, the authors also describe it as the need to set the path for younger generations for their well-being.

Schwartz (2010) proposed the theory of basic human values. He defined ten values (conformity, tradition, benevolence, universalism, self-direction, stimulation, hedonism, achievement, power, and security). Among those values, the author expresses that universalism, benevolence, conformity, security, and power affect prosocial behavior.

Bartlett & DeSteno (2006) posited that gratitude positively affected prosocial behavior. They mentioned that individuals feeling that emotions would reciprocate by helping. They go further by adding that it would help with building trust and relationship in the long term. They see their hypothesis confirmed.

Social classes represent another antecedent of prosocial behavior. Piff, Kraus, Côté, Cheng, & Keltner (2010) hypothesized that lower class individuals tend to help more than higher class

ones, the reasons being egalitarian, compassion, and to adjust to their difficult situation. They also mention that people with high earnings spend more on goods and extremely less to help others. The authors also discussed the importance of the cost of prosocial behavior which diminishes the willingness to help if it is high to the actors and augments the willingness if it is low to the actors. That was also validated by House et al. (2013).

Other researchers directed their interest towards parenting. Hastings, Rubin, & DeRose (2005) found that inhibited children (girls particularly) more prosocially behaved when they received maternal parenting.

Mimicry is another proposed construct used to predict prosocial behavior. Indeed, Van Baaren, Holland, Kawakami, & Van Knippenberg (2004), based on three studies, found that those who are mimicked tend to prosocially behave more than those who are not. In addition, the findings showed that the mimicked individuals did not only help those who mimicked them. They also helped people who did not mimicked them. Furthermore, Kulesza, Dolinski, Huisman, & Majewski (2014) informed that verbal mimicry (repeating words of others) increases the inclination of others to prosocially behave.

There has also been research based on the Norm Activation Model (NAM) (Schwartz, 1977) and its relationship with prosocial behavior. Three of its constructs (personal norms, awareness of consequences, and ascription of responsibility) have been tested and confirmed as affecting prosocial behavior (De Groot & Steg, 2009).

Other antecedents of prosocial behavior evoked in research were both the way money donators were asked to do so and being parts of groups or organization (Frey & Meier, 2004).

Mood has also been investigated and considered an antecedent of prosocial behavior. This was the focus of George (1991) who advanced that positive mood favorably affected prosocial behavior. The author explains that people with a positive mood "perceive stimuli in a more positive light" (George, 1991, p. 300). The author also adds that people with positive mood tend to help others. That act strengthens their willingness to help more.

Lee, Nam, Park, & Lee (2006) highlighted factors of prosocial behavior in the work context. They listed proposed both job satisfaction and organizational commitment as direct antecedents of prosocial behavior encouraged by the job requirement.

Antecedents of prosocial behavior	**Citations**
Gratitute	(Grant & Gino, 2010)
Affective reasoning, sympathy, and knowledge of currency	(Knight et al., 1994)
Altruism	(Lay & Hoppmann, 2015; Simpson & Willer, 2008; Stocks et al., 2009)
Basic human values	(Schwartz, 2010)
Gratitude	(Bartlett & DeSteno, 2006; Grant & Gino, 2010)
Social classes, cost of prosocial behavior	(House et al., 2013; Piff et al., 2010)
Parenting	(Hastings et al., 2005)
Mimicry	(Kulesza et al., 2014; Van Baaren et al., 2004)

Norm Activation Model (Personal norms, awareness of consequences, ascription of responsibility)	(De Groot & Steg, 2009; Schwartz, 1977)
Way to be asked, being part of a group	(Frey & Meier, 2004)
Mood	(George, 1991)
Job satisfaction, organization commitment	(Lee et al., 2006)

Table 2 Summary of literature on the antecedents of prosocial behavior

There is a large variety of domains used to study and examine prosocial behavior. However, among all those domains, it seems to us that personality traits have not yet been tested for their effect on prosocial behavior. That is what we tempt to achieve in this current study.

The following step in this study is that we develop the hypotheses about the relationship between each of the Big Five personality traits and prosocial moral reasoning and propensity to help.

Hypotheses Development

The model (both figures 1 and 2) was separated into two parts for better visibility of the relationships.

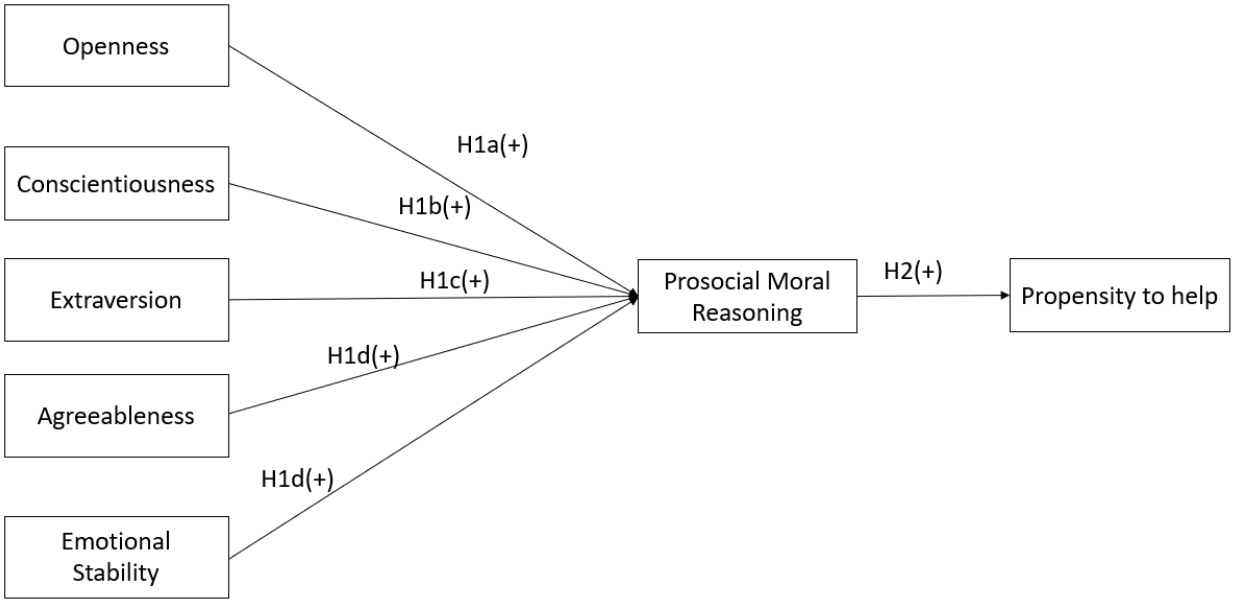

Figure 1 (Research model)

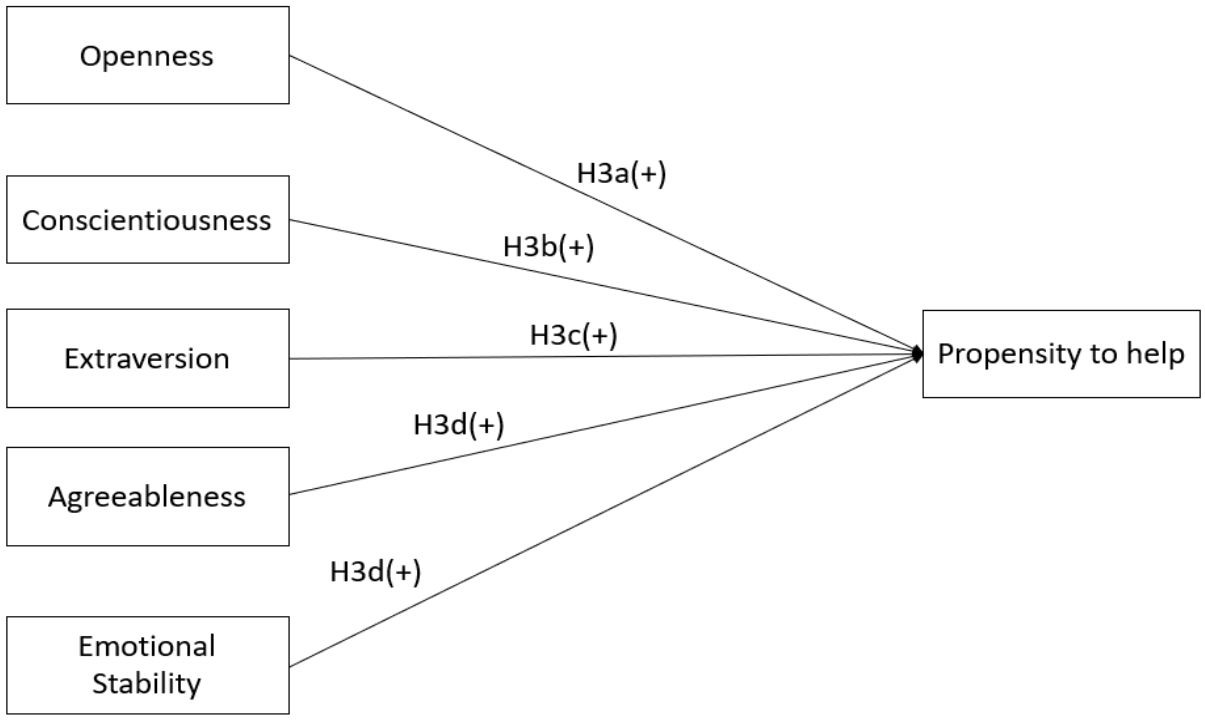

Figure 2 (Research model)

Sagar Athota, O, & Jackson (2009) in their research on emotional intelligence, the Big Five, and moral reasoning found that agreeableness, neuroticism, and openness were positively and significantly related to moral reasoning. Digman (1989) regards Openness as a factor "defined by

variables Cultured, Esthetically Fastidious, Imaginative, Socially Polished, and Independent-Minded."

H1a: *Openness is positively related to prosocial moral reasoning.*

H3a: *Openness is positively related to propensity to help.*

Tupes & Christal (1992) used "dependability" as one of the Big Five factors and defined it as orderliness, responsibility, perseverance, conventionality, and conscientiousness; the latter is what we used as part of the Big Five. To Digman (1989), it "denotes not only reliability and a sense of responsibility, but ""with conscience,"" as well.

H1b: *Conscientiousness is positively related to prosocial moral reasoning.*

H3b: *Conscientiousness is positively related to propensity to help.*

Extraversion "is best defined by the traits Talkative, Frankness, Adventurous, Assertiveness, Sociability, Energetic, Composed, Interest in Opposite Sex, and Cheerfulness" (Tupes & Christal, 1992). Extroverts were also learned to be sympathetic, friendly, appreciating, expressing, and approving others. (Bachrach, Kosinski, Graepel, Kohli, & Stillwell, 2012; Karumur, Nguyen, & Konstan, 2018). This positive attitude can facilitate prosocial reasoning. Moreover, Afolabi (2013) found that extraversion was positively and significantly related to prosocial behavior. If we take into consideration the fact that extraversion has been shown to be positively related to prosocial behavior, it would mean that it would positively predict the thought of helping which is prosocial moral reasoning.

H1c: *Extraversion is positively related to prosocial moral reasoning.*

H3c: *Extraversion is positively related to propensity to help.*

Agreeableness is defined by "the variables good-natured, not jealous, emotionally mature, mildness, cooperativeness, trustfulness, adaptability, kindliness, attentiveness to people, and self-sufficiency" (Tupes & Christal, 1992). Digman (1989) also adds that agreeableness "includes more than simply the tendency to agree readily with others. There is also an inclination toward submission (to other children and to authority). In addition, Kumar et al. (2017) mentions that "more agreeable people may exhibit one of the finer traits or tendencies such as having a soft heart, listening to other's opinion or feeling other's emotions." It means that in a situation that could necessitate a prosocial reasoning or behavior, an agreeable person could sympathize and feel what the person in need feels which would facilitate prosocial moral reasoning. In addition, Habashi et al. (2016) found that agreeableness triggers emotions towards people who are in need of assistance. Those emotions, then lead to the act of helping.

H1d: *Agreeableness is positively related to prosocial moral reasoning.*

H3d: *Agreeableness is positively related to propensity to help.*

Neuroticism is the inverse of emotional stability. Being neurotic means that one is hypochondriacal, not calm, emotionally unstable, jealous, not responsible, not kind (Tupes & Christal, 1992). Those who are neurotic "exhibit high sensitivity, insecurity, pessimism, self-consciousness, and are more susceptible to anger, anxiety, frustration, hopelessness, and negative emotions" (Karumur et al., 2018). Being in a case where there is a choice between helping or not, the hopeless, mean, and pessimistic aspect of neuroticism would make a person with this personality type have thoughts towards not helping rather than helping.

H1e: *Emotional stability is positively related to prosocial moral reasoning (Neuroticism is negatively related to prosocial moral reasoning).*

H3e: *Emotional stability is positively related to propensity to help (Neuroticism is negatively related to propensity to help).*

Eisenberg, (1982) discussed the relationship between prosocial moral reasoning and prosocial behavior. According to her, "whereas cause and effect are not clear, information regarding maturity of prosocial moral reasoning can aid in the prediction of prosocial behavior. This relationship increases our confidence that individuals' moral judgments actually provide information regarding their motivations for positive or selfish behaviors" (Eisenberg, 1982). It is true that our model does not include the actual prosocial behavior, but it covers the propensity to help. Propensity being an inclination or tendency, it seems apparent that this construct can be associated with prosocial moral reasoning before prosocial behavior.

H2: *Prosocial moral reasoning is positively related to propensity to help.*

Methods

Measures

The scores of the Big Five were from Personality Recognizer which "is a Java command-line application that reads a set of text files and computes estimates of personality scores along the Big Five dimensions" ("Personality Recognizer," n.d.). The scores are between 1 and 7 for each of the Big Five with 7 being strong. Personality Recognizer was implemented based on the work of Mairesse, Walker, Mehl, & Moore (2007) in which the authors worked on trying to identify the personality traits through data science techniques. The following are the steps the authors went through:

1. Collect individual corpora;

2.Collect associated personality ratings for each participant;

3.Extract relevant features from the texts;

4.Build statistical models of the personality ratings based on the features;

5.Test the learned models on the linguistic outputs of unseen individuals. (Mairesse et al., 2007)

The authors included LIWC (J. W. Pennebaker, Francis, & Booth, 2001) and MRC (Coltheart, 1981) into the models. LIWC stands for Linguistic Inquiry and Word Count. "LIWC is a transparent text analysis program that counts words in psychologically meaningful categories (Tausczik & Pennebaker, 2010)." MRC is a "computerized database of psycholinguistic information" (Coltheart, 1981). Mairesse et al (2007) showed "that personality can be recognized by computers through language cues " (Mairesse et al., 2007). The Big Five being predicted using those data science techniques along with personality scores of participants through Personality Recognizer, the choice of that application seemed evident.

Both Prosocial moral reasoning and propensity to help were measured by using the Adult Version of the Prosocial Reasoning Objective Measure (PROM-R) which is a modified form of the adolescent version (PROM) (Carlo et al., 1992). The PROM-R is composed of 7 prosocial situational stories and 1 sample given to the subjects (The researcher could choose all stories or less). After reading each story, the subjects have to decide (between three options) what the character should do (with 1 if helping would be the choice, 0 if not being sure would be the choice, and -1 if not helping would be the choice). The sum of each score for all the stories represents the measure of propensity to help. The subjects are also asked to rate (in terms of importance) 9 reasons or "reasoning items"(Carlo et al., 1992) for their choice from 1 being "Not at all" to 7 being "Greatly." Those items represent 5 reasoning types: hedonistic (2 items), approval-oriented (2 items), needs-oriented (1 item), stereotypic (1 item), internalized (2 items),

and a nonsense (1 item) which is used to eliminate the questionnaire of the distracted subjects from the sample. The reasoning type scores can be used for subsequent analysis. However, a composite prosocial reasoning score can be utilized. That is what we focused on in our research as the score of each reasoning type is not our center of interest. The composite score calculation steps were borrowed from the PROM scoring manual (Carlo et al., 1992).

Procedures

After IRB approval, the data collection occurred over a six-month period. All the instructions and questions were asked using Qualtrics. Each subject was asked to write a real-life-experience essay. It was a freestyle writing task. The subjects had the possibility to discuss other topics of their choice which were about their life experience if they ran out of ideas. In addition to this writing task, the subjects were given four stories in which the principal character had the choice to help other characters who would be in need. After reading each of the scenarios, the subjects were asked about their choice if they had to make the decision between helping or not (putting themselves in the shoes of the principal character) as well as the reasons leading to that choice. At the end of the session, each subject was given $10 as compensation. To keep their responses anonymous, the subjects were assigned random number (each) between 1 and 300. Each subject was asked to insert his/her random number at the beginning of the session via Qualtrics. The reason for using those random numbers was because each subject was given two Qualtrics links. The first link was that of the essay and the second was that of the prosocial behavior stories. The random numbers were used to integrate the responses and be able to match responses of the same subject from both Qualtrics links.

Participants

The participants of that study were university students who were 18 or older. One did not need to have a specific major in order to be part of the survey. All students from any majors, ethnicity,

religious beliefs, and gender were welcome to participate in the survey. The incentive was $10 for each subject after completing the survey. The subjects were told that they had the choice to withdraw from the survey at any time if they wanted to do so. They were also told that they would not be able to receive the $10 compensation if that would be the case. They were also reassured that their identity would be kept confidential. As proof, each of the subjects was given a random number (as mentioned in the procedures section) at the beginning of the survey session. That random number would be used as their identification number for their responses, which made their work anonymous. At the end of the survey, responses were integrated and downloaded as an Excel file from Qualtrics. Mediation (model #4) from PROCESS macro (Hayes, 2013) was applied to the data.

We collected two hundred sixty-nine responses. Eighteen of the responses were not used in the final analysis because of insufficient number (less than 1200 words in each essay), age (less than 18). 54.1% of the participants were male and 45.9% were female. The age range was from 18 to 44 with an average of 21. 91.45% of the participants were single, 6.32% were married, 0.37% were separated, 1.86% were divorced. Those who were completing the associate degree represented 3.72% of the total; those completing the bachelor's degree represented 88.85% of the total, those completing the master's degree represented 5.58%, and those working on the PhD represented 1.86% of the total. The participants who were employed represented 40.1% and those who were not employed represented 59.85%. Among the employed participants, 46.30% had been employed for less than a year; 50% had been between 1 and 5 years; 1.85% had been between 6 and 10 years; 0.93% had been between 11 and 15 years; and 0.93% had been for 15 and more years. Among the employed participants, 21.30% were full-time employees, 77.78% were part-time employees, and 0.93% were contractors. Concerning the salary, 76.85% of the

employed subjects were earning less than $25,000 per year; 16.67% were earning between $25,000 and $50,000 per year; 4.63% were earning between $51,000 and $75,000 per year; 0.93% were earning between $76,000 and $100,000; and 0.93% were earning more than $100,000. Among the employed participants, 7.41% were in upper management, 11.11% were in middle management, 11.11% were in lower management, and 70.37% were in non-management.

Demographic Information on the participants	
Category	Frequency
Gender	Male: 54.1%
	Female: 45.90%
Average Age	21
Marital Status	Single: 91.45%
	Married: 6.32%
	Separated: 0.37%
	Divorced: 1.86%
	Widowed: 0%
Education	Associate: 3.72%
	Bachelor: 88.85%
	Master: 5.58%
	PhD: 1.86%
Employment status	Yes: 40.1
	No: 59.85%
Employment Status	Full-time: 21.30%
	Part-time: 77.78%
	Contractor: 0.93%
Salary	<$25K: 76.85%
	$25-50K: 16.67%
	$51-75K: 4.63%
	$76-100K: 0.93%
	>$100K: 0.93%
Managerial role	Non-management: 70.37%
	Lower management: 11.11%
	Middle management: 11.11%
	Upper management: 7.41%
Percentages are estimated approximatively	

Table 3 Sample demographics

Results

Openness

In Table 5, we can notice that openness is positively and not significantly related to prosocial moral reasoning (b = 0.0454, p = 0.0889) controlling for both gender and age. Gender is negatively and not significantly related to prosocial moral reasoning (b = -0.0293, p =0.0645) controlling for both openness and age. Age is positively and not significantly related to prosocial moral reasoning (b = 0.0012, p =0.4697) controlling for both openness and gender.

In Table 7, we see that openness and positively and not significantly related to propensity to help (b = 0.1201, p = 0.1077) controlling for prosocial moral reasoning, gender, and age. Prosocial moral reasoning is positively and significantly related to propensity to help (b = 1.2334, p =0.0000) controlling for openness, gender, and age. Gender is negatively and not significantly related to propensity to help (b = -0.0507, p = 0.2529) controlling for openness, prosocial moral reasoning, and age. The latter is negatively and not significantly related to propensity to help (b = -0.0043, p = 0.3625) controlling for openness, prosocial moral reasoning, and gender.

With Tables 9, 10, and 11, we can infer that the total effect of openness on propensity to help is significantly different from zero (b = 0.1760, p =0.0302). There is also not enough evidence to state that there is mediation of prosocial moral reasoning as seen in Table 12 because zero is in the bootstrap confidence interval (between -0.0071 and 0.2665) (Table 12).

Conscientiousness

From Table 14, conscientiousness is positively and not significantly related to prosocial moral reasoning (b = 0.0101, p = 0.6665) controlling for both gender and age. Gender is negatively and significantly related to prosocial moral reasoning (b = -0.0337, p = 0.0325) controlling for both conscientiousness and age. The latter is positively and not significantly related to prosocial moral reasoning (b = 0.0012, p = 0.4932) controlling both conscientiousness and gender.

In Table 16, we notice that conscientiousness is positively and significantly related to propensity to help (b = 0.1282, p = 0.0475) controlling for prosocial moral reasoning, gender, and age. Prosocial moral reasoning is positively and significantly related to propensity to help (b = 1.2542, p = 0.0000) controlling for conscientiousness, gender, and age. Gender is negatively and not significantly related to propensity to help (b = -0.0543, p = 0.2148) controlling for conscientiousness, prosocial moral reasoning, and age. Age is negatively and not significantly related to propensity to help (b = -0.0050, p = 0.2945) controlling for conscientiousness, prosocial moral reasoning, and gender.

In Tables 18, 19, and 20, we can infer that the total effect of conscientiousness on propensity to help is significantly different from zero (b = 0.1408, p =0.0470). The direct effect of openness on propensity to help (as mentioned above) is significantly different from zero. There is also not enough evidence to affirm that there is mediating effect of prosocial moral reasoning because zero is in the bootstrap confidence interval (between -0.0432 and 0.0917) (Table 21).

Extraversion

Table 23 shows that extraversion is negatively and not significantly related to prosocial moral reasoning (b = -0.0193, p = 0.1884) controlling for both gender and age. Gender is negatively and significantly related to prosocial moral reasoning (b = -0.0344, p = 0.0278) controlling for both extraversion and age. The latter is positively and not significantly related to prosocial moral reasoning (b = 0.0013, p = 0.4590) controlling for both gender and extraversion.

In Table 25, extraversion is seen to be positively and not significantly related to propensity to help (b = 0.0289, p = 0.4804) controlling for prosocial moral reasoning. Prosocial moral reasoning is positively and significantly related to propensity to help (b = 1.2739, p = 0.0000) controlling for extraversion, gender, and age. Gender is negatively and not significantly related

to propensity to help (b = -0.0628, p = 0.1521) controlling for extraversion, prosocial moral reasoning, and age. Age is negatively and not significantly related to propensity to help (b = -0.0045, p = 0.3500) controlling for extraversion, prosocial moral reasoning, and gender.

Based on Tables 27, 28, and 29, we can infer that the total effect of extraversion on propensity to help is not significantly different from zero (b = 0.0043, p = 0.9228). The direct effect of extraversion on propensity to help (as mentioned above) is not significantly different from zero. There is also not enough evidence to affirm that there is mediating effect of prosocial moral reasoning because zero is in the bootstrap confidence interval (between -0.0572 and 0.0145) (Table 29)

Agreeableness

As seen in Table 32, agreeableness is negatively and not significantly related to prosocial moral reasoning (b = -0.0384, p = 0.2203) controlling for both gender and age. Gender is negatively and significantly related to prosocial moral reasoning (b = -0.0356, p = 0.0231) controlling for both agreeableness and age. The latter is positively and not significantly related to prosocial moral reasoning (b = 0.0010, p = 0.4091) controlling for both agreeableness and gender.

As noticed in Table34, agreeableness is positively and not significantly related to propensity to help (b = 0.0431, p = 0.6220) controlling for prosocial moral reasoning, gender, and age. Prosocial moral reasoning is positively and significantly related to propensity to help (b = 1.2703, p = 0.0000) controlling for agreeableness, gender, and age. Gender is negatively and not significantly related to propensity to help (b = -0.0616, p = 0.1616) controlling for agreeableness, prosocial moral reasoning, and age. The latter is negatively and not significantly related to

propensity to help (b = -0.0046, p = 0.3363) controlling for agreeableness, prosocial moral reasoning, and gender.

With Tables 36, 37, 38, we can infer that the total effect of agreeableness on propensity to help is not significantly different from zero (b = -0.0056, p = 0.9531). The direct effect of agreeableness on propensity to help (as mentioned above) is not significantly different from zero. There is also not enough evidence that mediation of prosocial moral reasoning exists because zero is in the bootstrap confidence interval (from -0.1197 to 0.0376) (Table 39).

Emotional Stability

From Table 41, emotional stability is positively and not significantly related to prosocial moral reasoning (b = 0.0297, p = 0.2782) controlling for both gender and age. Gender is negatively and significantly related to prosocial moral reasoning (b = -0.0345, p = 0.0275) controlling for both emotional stability and age. The latter is positively and not significantly related to prosocial moral reasoning (b = 0.0016, p = 0.3648) controlling for both emotional stability and gender.

Taking Table 43 into consideration, emotional stability is positively and significantly related to propensity to help (b = 0.1570, p = 0.0392) controlling for prosocial moral reasoning, gender, and age. Prosocial moral reasoning is positively and significantly related to propensity to help (b = 1.2390, p = 0.0000) controlling for emotional stability, gender and age. Gender is negatively and not significantly related to propensity to help (b = -0.0643, p = 0.1395) controlling for emotional stability, prosocial moral reasoning, and age. The latter is negatively and not significantly related to propensity to help (b = -0.0025, p = 0.6067) controlling for emotional stability, prosocial moral reasoning, and gender.

Based on Tables 45, 46, and 47, we can infer that the total effect of emotional stability on propensity to help is significantly different from zero (b = 0.1938, p = 0.0198). The direct effect

of emotional stability on propensity to help (as mentioned above) is significantly different from zero. There is also not enough evidence that mediation of prosocial moral reasoning exists because zero is in the bootstrap confidence interval (from -0.0262 to 0.0995) (Table 47).

Model Summary (Prosocial Moral Reasoning as outcome variable; openness as IV)						
R	**R-sq**	**MSE**	**F**	**df1**	**df2**	**p**
0.1764	0.0311	0.0151	2.6976	3.0000	252.0000	0.0464

Table 4

Model (Prosocial Moral Reasoning as outcome variable; openness as IV)						
	coeff	**se**	**t**	**p**	**LLCI**	**ULCI**
constant	1.7213	0.1075	16.0155	0.0000	1.5097	1.9330
Openness	0.0454	0.0266	1.7076	0.0889	-0.0070	0.0977
Gender	-0.0293	0.0158	-1.8570	0.0645	-0.0604	0.0018
Age	0.0012	0.0017	0.7240	0.4697	-0.0021	0.0046

Table 5

Model Summary (Propensity to help as outcome variable; openness as IV)						
R	**R-sq**	**MSE**	**F**	**df1**	**df2**	**p**
0.4451	0.1981	0.1172	15.5015	4.0000	251.0000	0.0000

Table 6

Model (Propensity to help as outcome variable; openness as IV)						
	coeff	**se**	**t**	**p**	**LLCI**	**ULCI**
constant	-2.1412	0.4249	-5.0398	0.0000	-2.9780	-1.3045
Openness	0.1201	0.0744	1.6145	0.1077	-0.0264	0.2665
PROM	1.2334	0.1753	7.0359	0.0000	0.8881	1.5786
Gender	-0.0507	0.0442	-1.1460	0.2529	-0.1378	0.0364
Age	-0.0043	0.0048	-0.9123	0.3625	-0.0137	0.0050

Table 7

Total Effect Model Summary (Propensity to help as outcome variable; openness as IV)						
R	**R-sq**	**MSE**	**F**	**df1**	**df2**	**p**
0.1999	0.0399	0.1397	3.4949	3.0000	252.0000	0.0162

Table 8

Total Effect Model (Propensity to help as outcome variable)						
	coeff	**se**	**t**	**p**	**LLCI**	**ULCI**
Constant	-0.0182	0.3266	-0.0556	0.9557	-0.6614	0.6251
Openness	0.1760	0.0807	2.1801	0.0302	0.0170	0.3350

Gender	-0.0868	0.0480	-1.8103	0.0714	-0.1813	0.0076
Age	-0.0028	0.0052	-0.5425	0.5880	-0.0130	0.0074

Table 9

Total effect of openness on propensity to help					
Effect	**se**	**t**	**p**	**LLCI**	**ULCI**
0.1760	0.0807	2.1801	0.0302	0.0170	0.3350

Table 10

Direct effect of openness on propensity to help					
Effect	**se**	**t**	**p**	**LLCI**	**ULCI**
0.1201	0.0744	1.6145	0.1077	-0.0264	0.2665

Table 11

Indirect effect (s) of Openness on propensity to help				
	Effect	**BootSE**	**BootLLCI**	**BootULCI**
Prosocial moral reasoning	0.0560	0.0362	-0.0071	0.1353

Table 12

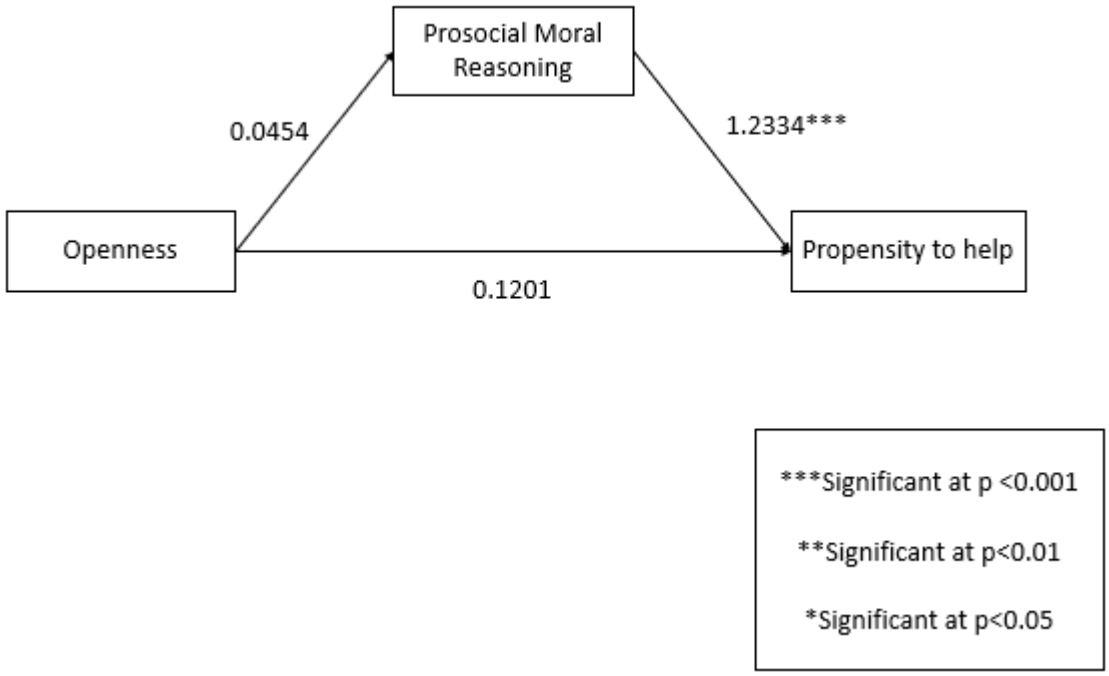

Figure 3 Research model results (Openness as independent variable)

Model Summary (Prosocial Moral Reasoning as outcome variable; conscientiousness as IV)						
R	**R-sq**	**MSE**	**F**	**df1**	**df2**	**p**
0.1436	0.0206	0.0153	1.7693	3.0000	252.0000	0.1535

Table 13

Model (Prosocial Moral Reasoning as outcome variable; conscientiousness as IV)						
	coeff	**se**	**t**	**p**	**LLCI**	**ULCI**
constant	1.8583	0.0899	20.6609	0.0000	1.6811	2.0354
Conscientiousness	0.0101	0.0233	0.4315	0.6665	-0.0358	0.0559
Gender	-0.0337	0.0157	-2.1498	0.0325	-0.0646	-0.0028
Age	0.0012	0.0017	0.6863	0.4932	-0.0022	0.0046

Table 14

Model Summary (Propensity to help as outcome variable)						
R	**R-sq**	**MSE**	**F**	**df1**	**df2**	**p**
0.4499	0.2024	0.1165	15.9216	4.0000	251.0000	0.0000

Table 15

Model (Propensity to help as outcome variable)						
	coeff	**se**	**t**	**p**	**LLCI**	**ULCI**
constant	-2.1751	0.4075	-5.3376	0.0000	-2.9776	-1.3725
Conscientiousness	0.1282	0.0643	1.9920	0.0475	0.0014	0.2549
PROM	1.2542	0.1739	7.2127	0.0000	0.9118	1.5967
Gender	-0.0543	0.0437	-1.2437	0.2148	-0.1403	0.0317
Age	-0.0050	0.0048	-1.0504	0.2945	-0.0144	0.0044

Table 16

Total Effect Model Summary (Propensity to help as outcome variable)						
R	**R-sq**	**MSE**	**F**	**df1**	**df2**	**p**
0.1925	0.0371	0.1401	3.2330	3.0000	252.0000	0.0230

Table 17

Total Effect Model (Propensity to help as outcome variable)						
	coeff	**se**	**t**	**p**	**LLCI**	**ULCI**
Constant	0.1556	0.2723	0.5716	0.5681	-0.3806	0.6918
Conscientiousness	0.1408	0.0805	1.9960	0.0470	0.0019	0.2797
Gender	-0.0966	0.0474	-2.0353	0.0429	-0.1900	-0.0031
Age	-0.0035	0.0052	-0.6745	0.5006	-0.0138	0.0067

Table 18

Total effect of conscientiousness on propensity to help					
Effect	**se**	**t**	**p**	**LLCI**	**ULCI**
0.1408	0.0705	1.9960	0.0470	0.0019	0.2797

Table 19

Direct effect of conscientiousness on propensity to help					
Effect	**se**	**t**	**p**	**LLCI**	**ULCI**
0.1282	0.0643	1.9920	0.0475	0.0014	0.2549

Table 20

Indirect effect (s) of conscientiousness on propensity to help				
	Effect	**BootSE**	**BootLLCI**	**BootULCI**
Prosocial moral reasoning	0.0126	0.0339	-0.0432	0.0917

Table 21

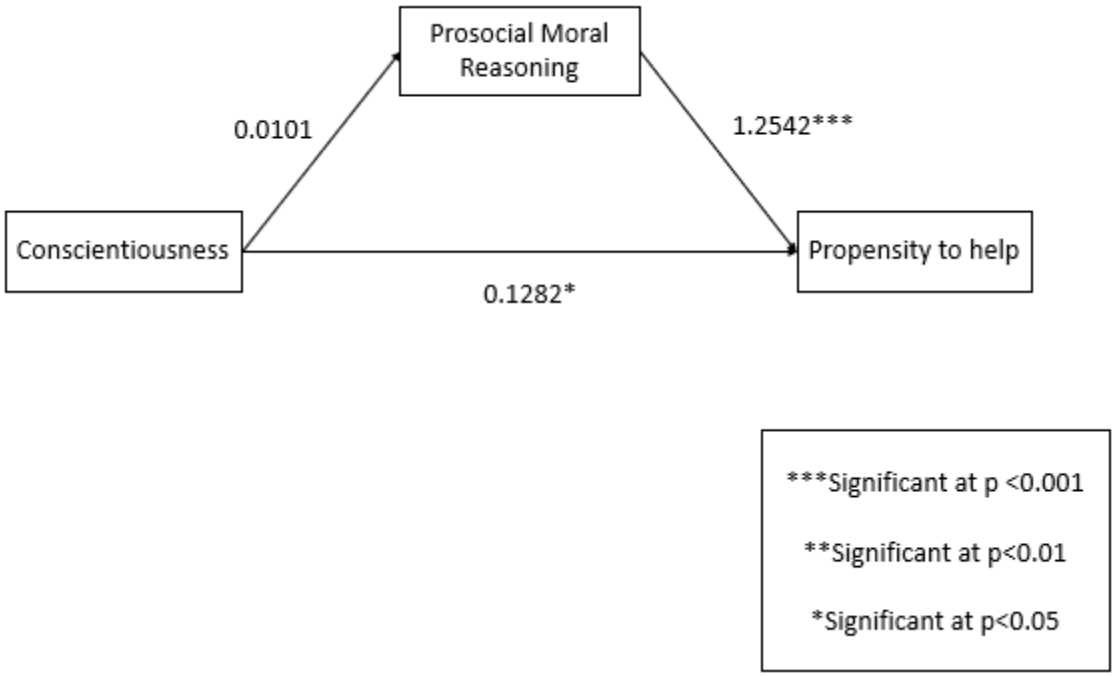

Figure 4 Research model results (Conscientiousness as independent variable)

Model Summary (Prosocial Moral Reasoning as outcome variable; extraversion as IV)						
R	**R-sq**	**MSE**	**F**	**df1**	**df2**	**p**
0.1632	0.0266	0.0152	2.2976	3.0000	252.0000	0.0781

Table 22

Model (Prosocial Moral Reasoning as outcome variable; extraversion as IV)						
	coeff	**se**	**t**	**p**	**LLCI**	**ULCI**
constant	1.9650	0.0657	29.9009	0.0000	1.8356	2.0944

Extraversion	-0.0193	0.0146	-1.3190	0.1884	-0.0481	0.0095
Gender	-0.0344	0.0155	-2.2131	0.0278	-0.0650	-0.0038
Age	0.0013	0.0017	0.7416	0.4590	-0.0021	0.0046

Table 23

Model Summary (Propensity to help as outcome variable)						
R	**R-sq**	**MSE**	**F**	**df1**	**df2**	**p**
0.4375	0.1914	0.1181	14.8513	4.0000	251.0000	0.0000

Table 24

Model (Propensity to help as outcome variable)						
	coeff	**se**	**t**	**p**	**LLCI**	**ULCI**
constant	-1.8693	0.3907	-4.7842	0.0000	-2.6388	-1.0998
Extraversion	0.0289	0.0409	0.7067	0.4804	-0.0516	0.1094
PROM	1.2739	0.1756	7.2537	0.0000	0.9280	1.6198
Gender	-0.0628	0.0437	-1.4365	0.1521	-0.1490	0.0233
Age	-0.0045	0.0048	-0.9363	0.3500	-0.0139	0.0049

Table 25

Total Effect Model Summary (Propensity to help as outcome variable)						
R	**R-sq**	**MSE**	**F**	**df1**	**df2**	**p**
0.1479	0.0219	0.1423	1.8785	3.0000	252.0000	0.1337

Table 26

Total Effect Model (Propensity to help as outcome variable)						
	coeff	**se**	**t**	**p**	**LLCI**	**ULCI**
Constant	0.6340	0.2011	3.1524	0.0018	0.2379	1.0300
Extraversion	0.0043	0.0447	0.0970	0.9228	-0.0838	0.0924
Gender	-0.1066	0.0475	-2.2426	0.0258	-0.2003	-0.0130
Age	-0.0029	0.0052	-0.5452	0.5861	-0.0132	0.0075

Table 27

Total effect of extraversion on propensity to help					
Effect	**se**	**t**	**p**	**LLCI**	**ULCI**
0.0043	0.0447	0.0970	0.9228	-0.0838	0.0924

Table 28

Direct effect of extraversion on propensity to help					
Effect	**se**	**t**	**p**	**LLCI**	**ULCI**
0.0289	0.0409	0.7067	0.4804	-0.0516	0.1094

Table 29

Indirect effect (s) of extraversion on propensity to help				
	Effect	**BootSE**	**BootLLCI**	**BootULCI**
Prosocial moral reasoning	-0.0246	0.0175	-0.0572	0.0145

Table 30

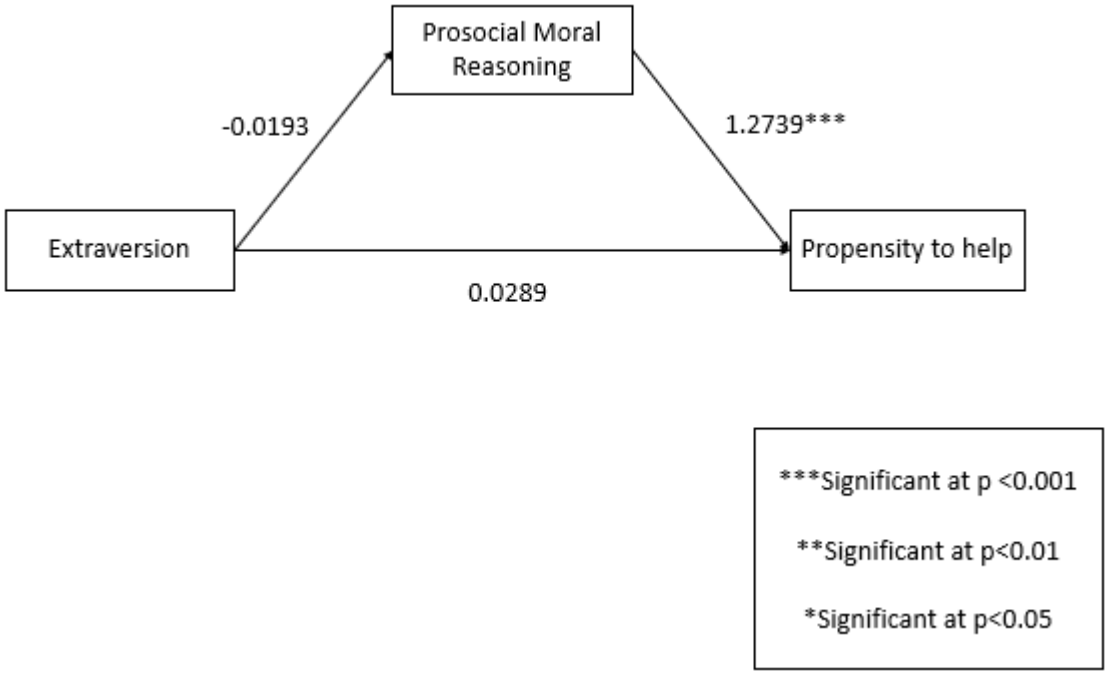

Figure 5 Research model results (Extraversion as independent variable)

Model Summary (Prosocial Moral Reasoning as outcome variable; agreeableness as IV)						
R	**R-sq**	**MSE**	**F**	**df1**	**df2**	**p**
0.1604	0.0257	0.0152	2.2194	3.0000	252.0000	0.0864

Table 31

Model (Prosocial Moral Reasoning as outcome variable; agreeableness as IV)						
	coeff	**se**	**t**	**p**	**LLCI**	**ULCI**
constant	2.0320	0.1186	17.1279	0.0000	1.7983	2.2656
Agreeableness	-0.0384	0.0313	-1.2287	0.2203	-0.0999	0.0232
Gender	-0.0356	0.0156	-2.2855	0.0231	-0.0663	-0.0049
Age	0.0014	0.0017	0.8269	0.4091	-0.0020	0.0048

Table 32

Model Summary (Propensity to help as outcome variable)						
R	**R-sq**	**MSE**	**F**	**df1**	**df2**	**p**
0.4365	0.1906	0.1183	14.7725	4.0000	251.0000	0.0000

Table 33

Model (Propensity to help as outcome variable)

	coeff	se	t	p	LLCI	ULCI
constant	-1.9109	0.4866	-3.9272	0.0001	-2.8693	-0.9526
Agreeableness	0.0431	0.0874	0.4937	0.6220	-0.1290	0.2153
PROM	1.2703	0.1756	7.2328	0.0000	0.9244	1. 6162
Gender	-0.0616	0.0439	-1.4037	0.1616	-0.1480	0.0248
Age	-0.0046	0.0048	-0.9633	0.3363	-0.0141	0.0048

Table 34

Total Effect Model Summary (Propensity to help as outcome variable)						
R	**R-sq**	**MSE**	**F**	**df1**	**df2**	**p**
0.1478	0.0219	0.1423	1.8765	3.0000	252.0000	0.1340

Table 35

Total Effect Model (Propensity to help as outcome variable)						
	coeff	**se**	**t**	**p**	**LLCI**	**ULCI**
Constant	0.6703	0.3629	1.8472	0.0659	-0.0443	1.3850
Agreeableness	-0.0056	0.0956	-0.0589	0.9531	-0.1939	0.1826
Gender	-0.1068	0.0476	-2.2418	0.0258	-0.2006	-0.0130
Age	-0.0028	0.0053	-0.5358	0.5926	-0.0132	0.0075

Table 36

Total effect of agreeableness on propensity to help					
Effect	**se**	**t**	**p**	**LLCI**	**ULCI**
-0.0056	0.0956	-0.0589	0.9531	-0.1939	0.1826

Table 37

Direct effect of agreeableness on propensity to help					
Effect	**se**	**t**	**p**	**LLCI**	**ULCI**
0.0431	0.0874	0.4937	0.6220	-0.1290	0.2153

Table 38

Indirect effect (s) of agreeableness on propensity to help				
	Effect	**BootSE**	**BootLLCI**	**BootULCI**
Prosocial moral reasoning	-0.0488	0.0386	-0.1197	0.0376

Table 39

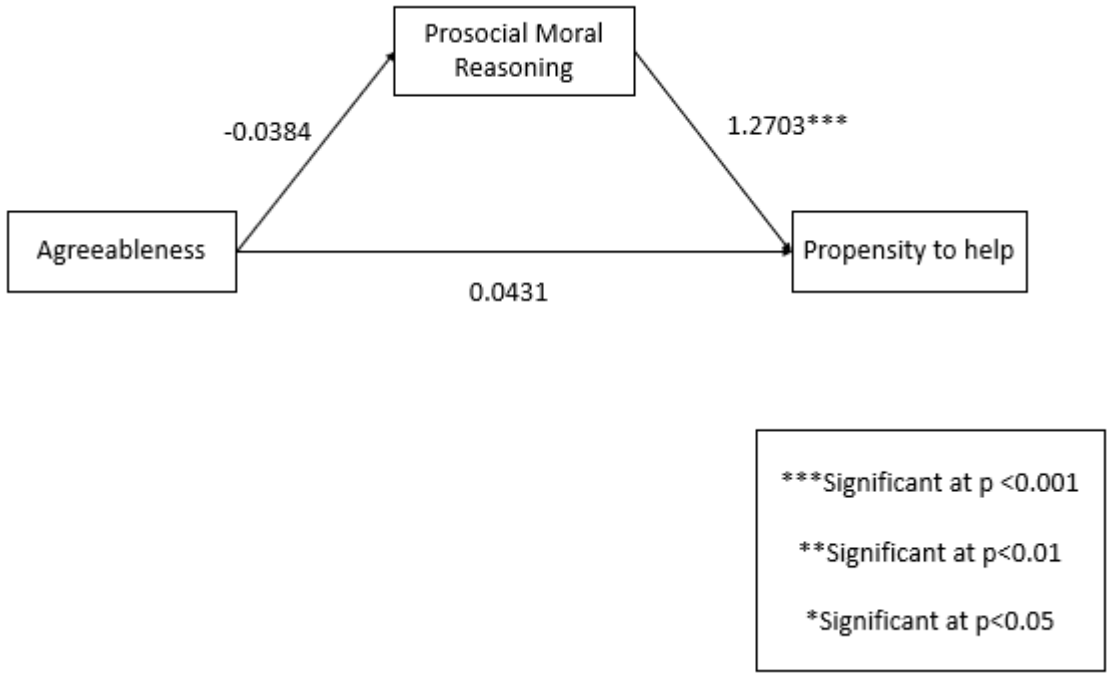

Figure 6 Research model results (Agreeableness as independent variable)

Model Summary (Prosocial Moral Reasoning as outcome variable; emotional stability as IV)						
R	**R-sq**	**MSE**	**F**	**df1**	**df2**	**p**
0.1564	0.0245	0.0152	2.1075	3.0000	252.0000	0.0998

Table 40

Model (Prosocial Moral Reasoning as outcome variable; emotional stability as IV)						
	coeff	**se**	**t**	**p**	**LLCI**	**ULCI**
constant	1.7906	0.1018	17.5808	0.0000	1.5900	1.9911
Emotional stability	0.0297	0.0273	1.0866	0.2782	-0.0241	0.0835
Gender	-0.0345	0.0156	-2.2169	0.0275	-0.0651	-0.0038
Age	0.0016	0.0017	0.9078	0.3648	-0.0019	0.0050

Table 41

Model Summary (Propensity to help as outcome variable)						
R	**R-sq**	**MSE**	**F**	**df1**	**df2**	**p**
0.4510	0.2034	0.1164	16.0229	4.0000	251.0000	0.0000

Table 42

Model (Propensity to help as outcome variable)						
	coeff	**se**	**t**	**p**	**LLCI**	**ULCI**

constant	-2.1412	0.4201	-5.3336	0.0000	-3.0677	-1.4131
Emotional stability	0.1570	0.0757	2.0728	0.0392	0.0078	0.3061
PROM	1.2390	0.1741	7.1157	0.0000	0.8961	1.5819
Gender	-0.0643	0.0434	-1.4823	0.1395	-0.1498	0.0211
Age	-0.0025	0.0048	-0.5155	0.6067	-0.0120	0.0070

Table 43

Total Effect Model Summary (Propensity to help as outcome variable)						
R	**R-sq**	**MSE**	**F**	**df1**	**df2**	**p**
0.2067	0.0427	0.1393	3.7480	3.0000	252.0000	0.0116

Table 44

Total Effect Model (Propensity to help as outcome variable)						
	coeff	**se**	**t**	**p**	**LLCI**	**ULCI**
Constant	-0.0220	0.3080	-0.0713	0.9432	-0.6285	0.5846
Openness	0.1938	0.0827	2.3442	0.0198	0.0310	0.3566
Gender	-0.1071	0.0470	-2.2763	0.0237	-0.1997	-0.0144
Age	-0.0005	0.0053	-0.1000	0.9204	-0.0109	0.0099

Table 45

Total effect of emotional stability on propensity to help					
Effect	**se**	**t**	**p**	**LLCI**	**ULCI**
0.1938	0.0827	2.3442	0.0198	0.0310	0.3566

Table 46

Direct effect of emotional stability on propensity to help					
Effect	**se**	**t**	**p**	**LLCI**	**ULCI**
0.1570	0.0757	2.0728	0.0392	0.078	0.3061

Table 47

Indirect effect (s) of emotional stability on propensity to help				
	Effect	**BootSE**	**BootLLCI**	**BootULCI**
Prosocial moral reasoning	0.0368	0.0320	-0.0262	0.0995

Table 48

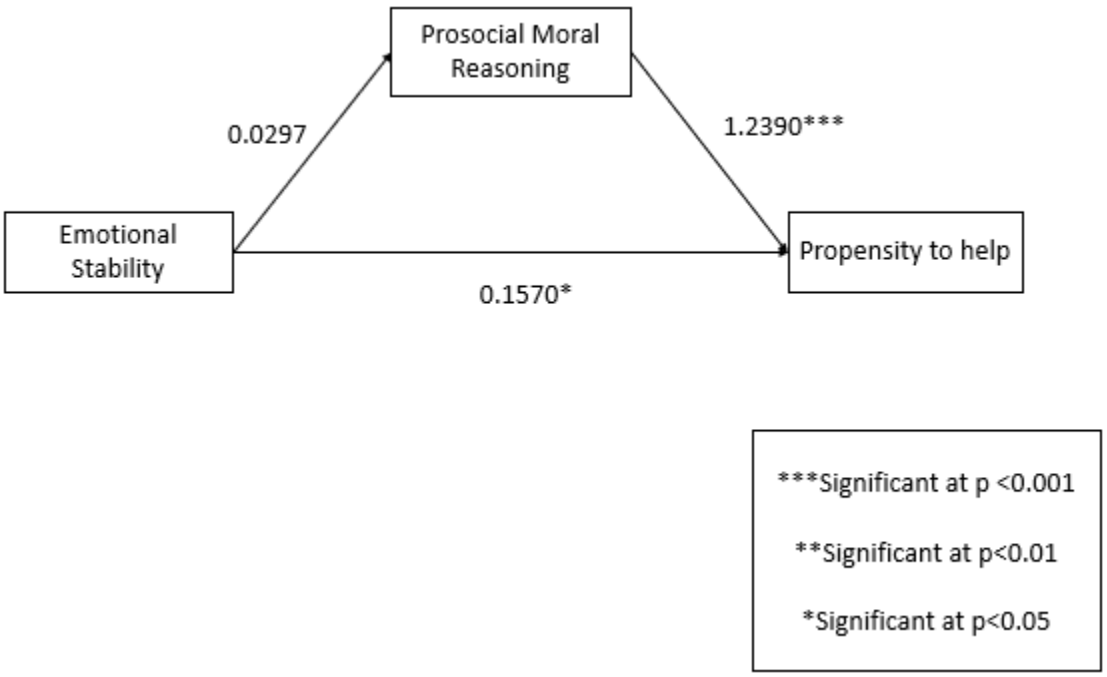

Figure 7 Research model results (Emotional stability as independent variable)

H	Hypothesis	Result
H1a	Openness is positively related to prosocial moral reasoning.	Not Supported
H1b	Conscientiousness is positively related to prosocial moral reasoning.	Not Supported
H1c	Extraversion is positively related to prosocial moral reasoning.	Not supported
H1d	Agreeableness is positively related to prosocial moral reasoning.	Not supported
H1e	Neuroticism is negatively related to prosocial moral reasoning; Emotional stability is positively related to prosocial moral reasoning.	Not supported
H2	Prosocial moral reasoning is positively related to propensity to help.	Supported

H3a	Openness is positively related to propensity to help.	Not supported
H3b	Conscientiousness is positively related to propensity to help.	Supported
H3c	Extraversion is positively related propensity to help.	Not supported
H3d	Agreeableness is positively related to propensity to help.	Not supported
H3e	Neuroticism is negatively related to propensity to help.; Emotional stability is positively related to propensity to help.	Supported

Table 49 Hypotheses results summary

Discussion

Key Findings and Contributions

The results show that prosocial moral reasoning was positively and significantly related to propensity to help. That was expected to the extent that prosocial moral reasoning has been mentioned to directly predict prosocial behavior. In addition, that relationship seemed to have been confirmed (Carlo et al., 1992). Among the Big Five personality traits, both conscientiousness and emotional stability were positively and significantly related to propensity to help. Being conscientious would mean that one takes situations coming to oneself into consideration and seriously. Also, by being conscientiousness, one tends to follow the norms and what is or should be expected to be done. Given the situational stories, a person scoring high in conscientiousness would consider helping the right and expected behavior. Emotional stability was also positively related to propensity to help. By considering that neuroticism is the opposite of emotional stability, it goes without saying that there is a high chance of it being negatively and significantly related to prosocial behavior. That is due to the fact that the person high in

neuroticism would be moodier, more jealous, more envious, more anxious than other people low in neuroticism. Those descriptive traits would not be favorable to prosocial behavior; which would mean that emotionally stable individuals would tend to prosocially behave. Gender was also significantly and negatively related to prosocial moral reasoning in the case of conscientiousness, extraversion, agreeableness, and emotional stability. However, it did not have any significant effect on propensity to help. It could mean that gender may influence the way one thinks through prosocial moral reasoning in the context of prosocial behavior.

Conclusion and Future Research

This study has focused on the relationship between each of the Big Five personality traits and both prosocial moral reasoning and propensity to help. Both conscientiousness and emotional stability were positively and significantly related to propensity to help. Not all the Big Five had a significant effect on either prosocial moral reasoning or propensity to help. It may lead us to think that only some of the Big Five traits have effect on propensity to help depending on how high they are compared to the rest of the other Big Five traits. Thanks to this study, we can understand that both conscientiousness and emotional stability along with gender are decisive in the decision making in the prosocial behavior context.

In future research, a way to study the relationship between the Big Five, prosocial moral reasoning, and prosocial behavior would be to use the Big Five traditional instrument that subjects are to complete. That questionnaire is composed of multiple items. That along with the answers of the stories given to the subjects could be used in structural equation modeling.

Appendix A: Demographics Survey

Q1 Please indicate your Gender

□ Male

□ Female

Q2 Please write your age

Q3 What is your marital status?

□ Single, never married

□ Married

□ Seperated

□ Divorced

□ Widowed

Q4 What degree are you currently pursuing?

□ Associate's

□ Bachelor's

□ Master's

□ PhD

Q5 What is your current major?

Q6 Are you currently employed?

□ Yes

□ No

Q7 How many years have you been at this company?

□ Less than one year

□ 1-5 years

□ 6-10 years

□ 11-15 years

□ 15+ years

Q8 What is your position at this company?

Q9 Are you a full time or part time employee?

□ Full-time

□ Part-time

□ Contractor

Q10 Are you a management or non-management employee?

□ Upper Management

□ Middle Management

□ Lower Management

□ Non-management

Q11 Before taxes, what is your annual income?

□ Less than $25,000

□ $25,000-$50,000

□ $51,000-$75,000

□ $76,000-$100,000

□ $100,000+

Q12 What is the size of your department?

□ 1-10 employees

□ 11-20 employees

□ 21-30 employees

□ 31-40 employees

□ 40+ employees

Q13 What is the size of your company?

□ 1-250 employees

□ 250-500 employees

□ 500-750 employees

□ 750-1,000 employees

□ 1,000+ employees

Q14 What industry does your company belong too?

□ Telecommunications

□ Manufacturing

□ Banking/Finance

□ IT Consulting

□ Retail

□ Healthcare

□ Government (City, State or Federal)

□ Defense Firm (i.e. Lockheed Martin, Raytheon, etc.)

□ Education

□ Media

□ Other

Appendix B: Essay Prompt

Directions

You are to provide an essay (written in a Word document) of at least 1200 words about your real-life experience (It could be anything you would like; bad experience, good experience, or both). You have to make sure that the level of English you are using is the regular one that you use in your daily life. The essay does not require any formal introduction, development, or conclusion. You can just separate each of your different entries by going to the next line. Your work should be single space, 0 point spacing before and after paragraphs. After essay completion, please verify that it has at least 1200 words (The number of words is located on bottom left side of the Word page), copy the essay, and then paste it into the provided cell from your Qualtrics survey.

N.B. Your essay should not contain your name (You will be asked to write your name in a separate question from the UTA Qualtrics surveys). Your name will strictly and only be used to match your responses from the first session survey (including the essay) and those from the second session survey. Except that matching step, your name will not have any other purpose.

Appendix C: Insider Threat Survey

INSTRUCTIONS

1. Carefully read the stories and make sure all the questions are answered.
2. If you have any questions at any time, please ask!
3. When you are done, close the booklet and wait for further instructions.

Teasing Story

Sandy was a student in high school. One day Sandy was walking into her new class early and saw an older girl teasing and making fun of another girl's clothes. The girl was crying. There was no one else around and Sandy did not know the girls very well, but she had heard that the girl that was being teased was very poor and the older girl had a lot of friends. Sandy thought that maybe she should try to stop the older girl but she was afraid that the older girl and her friends might pick on her and tease her also.

What should Sandy do? (Check one)
_____ Sandy should try to stop the older girl
_____ Not sure
_____ Sandy should not stop the older girl

How important were each of the following reasons in making your decision? Please rate each reason using the following 7-point scale (Circle your answers):

Not at all			Somewhat			Greatly	
1	2	3	4	5	6	7	a. it depends whether Sandy thinks the older girl is mean or not
1	2	3	4	5	6	7	b. it depends whether the other Girl is very upset
1	2	3	4	5	6	7	c. it depends whether Sandy can find other friends to do things with in school
1	2	3	4	5	6	7	d. it depends whether Sandy thinks that she is doing what she believes she should do
1	2	3	4	5	6	7	e. it depends whether Sandy's classmates would approve of what she does
1	2	3	4	5	6	7	f. it depends whether Sandy

							is morally abstracted about affective ties or not
1	2	3	4	5	6	7	g. it depends whether her classmates would agree with her choice of action
1	2	3	4	5	6	7	h. it depends on whether she thinks she might be hurt physically if she helped
1	2	3	4	5	6	7	i. it depends if Sandy believes that each person is of equal worth

Math Story

Julie knows a lot about math. One day a girl who had just moved into Julie's class asked Julie to help her with her math homework that weekend. The girl was having a hard time catching up with her math class, she had only the weekend to prepare for the math test the next Monday, and the girl needed to pass. If Julie helps the girl with her math homework, then she will not be able to go to the beach with her friends that weekend.

What should Julie do? (Check one)
_____ Julie should help the girl with the math homework
_____ Not sure
_____ Julie should go to the beach with her friends

How important were each of the following reasons in making your decision? Please rate each reason using the following 7-point scale (Circle your answers):

Not at all			Somewhat			Greatly	
1	2	3	4	5	6	7	a. it depends whether Julie's parents and friends think she did the right thing or the wrong thing
1	2	3	4	5	6	7	b. it depends if Julie thinks its the decent thing to do or not
1	2	3	4	5	6	7	c. it depends if Julie thinks the girl really needs help or not
1	2	3	4	5	6	7	d. it depends if Julie really wants to go to the beach or not
1	2	3	4	5	6	7	e. it depends whether justice can be served in furthering the cause of reciprocity in priorities

1	2	3	4	5	6	7	f. it depends whether Julie feels that everyone is better off if each person helps others
1	2	3	4	5	6	7	g. it depends whether Julie would be embarrassed if other people found out
1	2	3	4	5	6	7	h. it depends whether Julie felt concern about the other girl's situation
1	2	3	4	5	6	7	i. it depends whether helping the other girl would also better prepare Julie for the test

Bully Story

One day while Dave was busy in his yard, he saw a bully push and tease another child whom he did not know. There was not anyone else around. As Dave watched, the one boy kept pushing the other boy down every time he tried to get back up. Dave was having a good time and the bully might pick on him too if he tried to help.

What should Dave do? (Check one)
_____ Dave should stay in his yard
_____ Not sure
_____ Dave should go and help the other child

How important were each of the following reasons in making your decision? Please rate each reason using the following 7-point scale (Circle your answers):

Not at all			Somewhat			Greatly	
1	2	3	4	5	6	7	a. it depends if the other boy is getting hurt or not
1	2	3	4	5	6	7	b. it depends if Dave feels concerned about the other boy or not
1	2	3	4	5	6	7	c. it depends if Dave thinks not helping would be mean or okay
1	2	3	4	5	6	7	d. it depends if Dave feels responsible about the nature of principled pathology
1	2	3	4	5	6	7	e. it depends if Dave is having a lot of fun or not

1	2	3	4	5	6	7	f. it depends on what Dave's parents and friends will think if he helps or doesn't help
1	2	3	4	5	6	7	g. it depends whether Dave thinks he himself will get hurt
1	2	3	4	5	6	7	h. it depends whether he thinks others in the community would think it was irresponsible if he did not help
1	2	3	4	5	6	7	i. it depends if Dave would feel guilty if the boy is hurt because he did not help

Swimming Story

Scott was very good at swimming. He was asked to help young handicapped children who could not walk, learn to swim so that they could make their legs strong for walking. Scott was the only one in town who could do the job because he was a good swimmer and a swimming teacher. But helping the crippled children would take much of Scott's free time left after work and Scott wanted to practice swimming very hard for an important swimming contest coming up. If Scott could not practice swimming in all his free time, he would probably lose the swimming contest and not receive the prize for winning, which was money. Scott was planning to use the prize money for his college education or for other things he wanted.

What should Scott do? (Check one)
_____ Scott should teach the swimming class
_____ Not sure
_____ Scott should practice for the swimming contest

How important were each of the following reasons in making your decision? Please rate each reason using the following 7-point scale (Circle your answers):

Not at all			Somewhat			Greatly	
1	2	3	4	5	6	7	a. it depends on the natural philosophies of ethical stature and societal incorporation
1	2	3	4	5	6	7	b. it depends whether Scott believes teaching the children is the decent thing to do
1	2	3	4	5	6	7	c. it depends if Scott really wants to win the swimming contest

1	2	3	4	5	6	7	d. it depends if the handicapped children's legs hurt or not
1	2	3	4	5	6	7	e. it depends whether Scott's parents and the community will think he did the right thing or he did the wrong thing
1	2	3	4	5	6	7	f. it depends whether or not Scott would feel good about the children being able to walk better
1	2	3	4	5	6	7	g. it depends whether the community would support his decision
1	2	3	4	5	6	7	h. it depends if Scott really needs the money for college
1	2	3	4	5	6	7	i. it depends if Scott thinks every person deserves an equal chance in life

Chapter 4: Essay 3

Introduction

Information security is paramount to the survival of organizations (Hwang & Cha, 2018; Ifinedo, 2014; Kajtazi & Bulgurcu, 2013; Sohrabi Safa, Von Solms, & Furnell, 2016). Organizational information systems are increasingly at risk of being illegally accessed. By all accounts, threats to information may occur because of external or other reasons such as hacking, system failures, or even natural disasters. However, it is important to also take into consideration those individuals (employees of those organizations) who take advantage of their information access privileges to harm organizations (Kowalski Dawn Cappelli Tara Conway Bradford Willke Susan Keverline & Moore Megan Williams, 2008; Kowalski & Cappelli, 2008; McKinney et al., 2013). According to Willison & Warkentin (2013), "insiders are employees or others who have (1) access privileges and (2) intimate knowledge of internal organizational processes that may allow them to exploit weaknesses" (Willison & Warkentin, 2013, p. 2).

The potential wrongdoings of those employees are sometimes due to frustration, anger, or conflict in the work environment (McKinney et al., 2013). Nurbhai (2014) studied some of those antecedents (both anger and conflict) and their relationship with noncompliance. The author used situational stories reflecting conflict in the work setting. To be more precise, those stories deal with a supervisor illtreating a subordinate. The latter, while in search for a new employment, uses proprietary information of his current employer to give himself more chance to successfully be hired.

As mentioned above, there are both external and internal information security threat to organizations. The act of insiders (employees of organizations), besides frustration, irritation,

and anger, could be also related to their personality. That is what we try to examine in this study using the Big Five.

The Big Five is represented by five personality traits, namely, openness, conscientiousness, extraversion, agreeableness, and neuroticism/emotional stability. Everyone has each of these traits at different levels. There is almost no need to say that personality plays a role in the way one behaves. To our knowledge, there has not been research that investigates the effect (particularly the moderating effect) of the Big Five on the relationship between conflict and noncompliance to information security policies. This current study builds on the work of Nurbhai (2014). In addition to examining the relationship between conflict and noncompliance behavior, it also investigates the moderating effect of the Big Five personality traits on the relationship.

This current study, as a result, is conducted to answer the following research questions.

Does each of the Big Five personality traits moderate the relationship between conflict and noncompliance behavior?

Does conflict predict noncompliance behavior?

This study is a contribution to research to the extent that its results will help to pinpoint the specific personality traits that significantly affect noncompliance behavior in the context of insider threat. Consequently, this study will help hiring companies in hiring employees who would be working with sensitive information. This study also contributes to literature as its results bring new insights on the role of the Big Five security.

The remainder of this paper is as follows: we have a section that covers the literature review on information security, compliance, conflict at work, and the Big Five. We then support and present the hypotheses. We then explain the methodology and discuss the results. We complete with limitations, conclusion, and future directions.

Literature review

Information security/Compliance

As mentioned in the preceding section, threats to illegal information access and breaches could occur because of external or internal sources. The external threat could rise from deliberate human actions or because of disruption caused by other factors. For example, external threats associated with humans includes malicious acts of hackers or spies (Willison & Warkentin, 2013). The nonhuman external threat includes system failures, telecommunication failures, natural disasters or any sort of malware (Willison & Warkentin, 2013). Likewise, internal threats can also be human or nonhuman. The human internal threat, which is the focus of this study, includes employees and other insiders (Willison & Warkentin, 2013). The nonhuman internal threat deals with unexpected events such as power surges and hardware failures (Willison & Warkentin, 2013).

In both human and internal threat, there is a continuum representing the intent of IS policy violations. The intent could be passive, non-volitional noncompliance in which the person may be unaware of the violation, enters data accidentally, or forgets to complete security related tasks. (Willison & Warkentin, 2013) . The intent could be volitional (but not malicious) noncompliance. In such cases, the insider could fail to log off the computer when leaving the work site, may procrastinate or avoid taking backups, or may fail to adhere to the policy of changing passwords regularly (Willison & Warkentin, 2013) . The intent could also be a

deliberate and malicious (harmful) computer abuse. Under such circumstances, the person could steal data or corrupt it, commit fraud, embezzlement, or sabotage, or could deliberately violate policy (Willison & Warkentin, 2013). The relative dearth of empirical studies on intentional malicious computer abuse provides the primary motivation for our study.

The study by McKinney et al. (2013) involved employees who had caused harm to their organizations by using computer systems. Furthermore, they had stolen proprietary information in very serious and sensitive sectors. The results of their study showed that most of the insiders were current or former employees. The main reason for their malicious acts was revenge brought forth by factors such as the termination of employment, grievance, dissatisfaction with the company, financial gain, and disagreement with current employer.

The consequences of information security and privacy violations can be dire and organizations must proactively deal with such threats. While studies have examined organizational efforts to thwart malicious attacks that originate outside, there is an imperative need to fully understand the motivations and implications of employees' non-adherence to security policies.

Bulgurcu, Cavusoglu, & Benbasat (2010) studied the antecedents of compliance with information security policy (ISP) by employees. They found that attitude, normative beliefs, and self-efficacy play a major role in the intention to comply with ISP. Goo, Yim, & Kim (2014) also tried to tease out other reasons why employees would or would not comply with security policy. They employed the term "security avoidance" (Goo et al., 2014, p. 292) that they define as a conscientious or intentional act of avoiding information security policy or procedure despite knowing the importance and need to comply. The authors found that the strong security mindset and attitude (led by organizations) can replace deterrence by the use of sanctions.

Conflict at Work

Conflict was defined as incompatibilities (Boulding, 2018; Jehn, 1995) or "perceptions by the parties involved that they hold discrepant views or have interpersonal incompatibilities" (Jehn, 1995, p. 257). Conflict is also defined as "an awareness on the part of the parties involved of discrepancies, incompatible wishes, or irreconcilable desires" (Boulding, 2018; Jehn & Mannix, 2001, p. 238). Jehn & Mannix (2001) suggested that conflict, in work groups, be categorized into three types, namely, relationship, task, and process conflict (Jehn & Mannix, 2001).

Relationship conflict is the state of noticing interpersonal incompatibilities. It comprises feelings such as experiencing tension and discord. Relationship conflict involves personal problems such as hostility among individuals and sentiments of "annoyance, frustration, and irritation" (Jehn & Mannix, 2001, p.1)"

Task conflict deals with differing points of view concerning group task (Jehn & Mannix, 2001). "Task conflicts may coincide with animated discussions and personal excitement but, by definition, are void of the intense interpersonal negative emotions that are more commonly associated with relationship conflict" (Jehn & Mannix, 2001, p.1).

Process conflict deals with disagreement on how task should be completed. More precisely, process conflict relates to the task assignment; how much task should be assigned to whom in the group (Jehn & Mannix, 2001). An example of process conflict would be when members of a group disagree on the responsibility of one another about a specific assignment to complete (Jehn & Mannix, 2001).

Big Five

The Big Five, also known as the five-factor model, corresponds to five personality traits, namely, openness, conscientiousness, extraversion, agreeableness, and neuroticism / emotional stability. There have been many empirical studies on the five-factor model and its implications for human actions. It's comprehensiveness was confirmed by Connor (2002). That comprehensiveness was in relation to the popular personality inventories (PPI). The Big Five has two origins, one based on the use of words (i.e., lexical) and the other on the traditional questionnaire or survey (Mccrae et al., 1992). The lexical roots of the Big Five Model may be traced to the works of Norman (1963). Peabody & Goldberg (1989) affirmed that the order in which the factors appeared was approximately the same as the way they were represented in the traits' definition from the dictionary. Regarding the questionnaire origin, the inception of the Big Five comes from H.J. Eysenck who recognized extraversion and neuroticism as main parts of psychological test (Norman, 1963). Costa Jr & McCrae (1980) contributed to the creation of the Big Five by adding openness and creating scales for agreeableness and conscientiousness (Mccrae et al., 1992).

In this study, we use each of the Big Five personality traits as moderators in our models (Figures 1-5).

Hypotheses development

Perceiving conflict (at a personal level between individuals) animates or triggers feelings of frustration or anger. Depending on the context or how serious that conflict is, this could lead to thoughts about retaliation or even the act of retaliating. Aquino, Tripp, & Bies (2001) also identified revenge as the reaction provoked by wrongdoing of other people to oneself. Based on those assertions, we can hypothesize that conflict would lead to noncompliance behavior.

H1: *Conflict will be positively related to noncompliance behavior*

Zeng & Xia (2019) examined the relationship between anger rumination (constant thinking about anger-triggering situations) and interpersonal openness. The results of their two studies, which were 6 months apart, showed that interpersonal openness was negatively related to anger rumination. Among the results, interpersonal openness proved to be positively related to openness to experience. If we assume that conflict could provoke some emotional turbulence such as anger or frustration which could then facilitate a noncompliance behavior, openness could be considered a trait that would inhibit those feelings. By suppressing those feelings, we can hypothesize that openness would restrain the effect of conflict on noncompliance behavior.

H2: *The relationship between conflict and noncompliance behavior will be negatively moderated by high value of openness*

Jensen-Campbell, Knack, Waldrip, & Campbell (2007) investigated whether the combination of the Big Five personality dimensions and self-control would have a moderating effect on the relationship between anger and aggression. In order to represent aggression, the participants were told to choose a combination of substance that other fictitious participants (who had evaluated their previous task positively or negatively) would have to drink. The participants had the mixes options namely, sugar and water, apple juice and water, lemon juice and water, vinegar and water, and hot sauce and water. The mix would represent the level of aggression. Their results showed that not only was conscientiousness negatively related to anger, but it also moderated the relationship between anger and aggression. Decuyper, De Bolle, & De Fruyt (2011) also examined the connections between anger and general and dysfunctional traits in a sample of men, among whom were forensic psychiatric male patients (Decuyper et al., 2011). The results of their study showed that conscientiousness played the role of inhibitor in the significant prediction of anger by neuroticism, agreeableness, and expressive traits. Based on the results of

both Jensen-Campbell et al. (2007) and Decuyper et al. (2011), we hypothesize that conscientiousness will play a moderating role in the relationship between conflict and noncompliance behavior.

H3: *The relationship between conflict and noncompliance behavior will be negatively moderated by conscientiousness*

In their study on the moderating effect of the Big Five on the relationship between conflict and well-being, Dijkstra, van Dierendonck, Evers, & De Dreu (2005) found that conflict is negatively related to well-being for those who are extraverted (Dijkstra et al., 2005). Thus, we can hypothesize that extraversion will moderate the relationship between conflict and noncompliance behavior.

H4: *The relationship between conflict and noncompliance behavior will be negatively moderated by extraversion.*

Jensen-Campbell & Graziano (2001) attempted to study the relationship between agreeableness and interpersonal conflicts in a teacher and students setting. The result of their research showed that individuals who were higher in agreeableness opted for compromises rather than the destructive tactics that were opted by counterparts who were lower in agreeableness(Jensen-Campbell & Graziano, 2001). Furthermore, the authors noted that participants (adolescents) were more in favor of constructive conflict tactics than their counterparts who were less agreeable (Jensen-Campbell & Graziano, 2001). Dijkstra, van Dierendonck, Evers, & De Dreu, (2005) studied the moderating effect of the Big Five on the relationship between conflict and well-being. The results of their research showed that conflict was negatively related to well-being and that that relationship was noticeably moderated by low level of agreeableness. The authors

further posited that "[their] finding also makes it plausible, that the specific ways agreeable people interpret and perceive conflict situations to maintain positive social relations, prevent them from experiencing the negative consequences of conflict for well-being" (Dijkstra et al., 2005, p. 92). This suggests that agreeableness should play a negative and moderating role in the relationship between conflict and noncompliance behavior.

H5: *The relationship between conflict and noncompliance behavior will be negatively moderated by agreeableness*

Dijkstra et al. (2005), as mentioned above, also tested the moderation effect of emotional stability in the relationship between conflict and well-being. They found that more conflict was negatively related to well-being at low level of emotional stability (Dijkstra et al., 2005). It means that we can hypothesize that emotional stability would moderate the relationship between conflict and noncompliance behavior.

H6: *The relationship between conflict and noncompliance behavior will be negatively moderated by emotional stability*

The research models corresponding to the hypotheses are shown below.

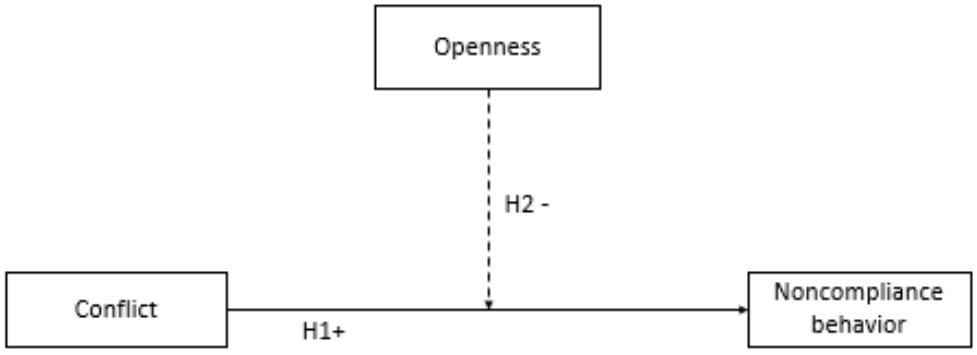

Figure 1 Research Model (Openness as moderator)

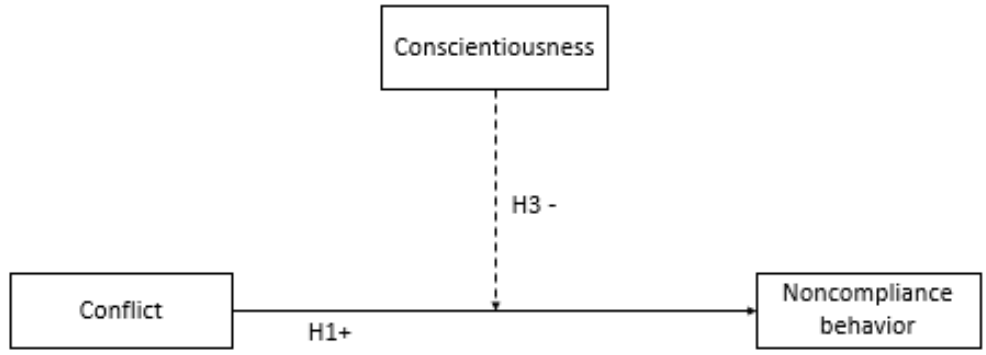

Figure 2: Research Model (Conscientiousness as moderator)

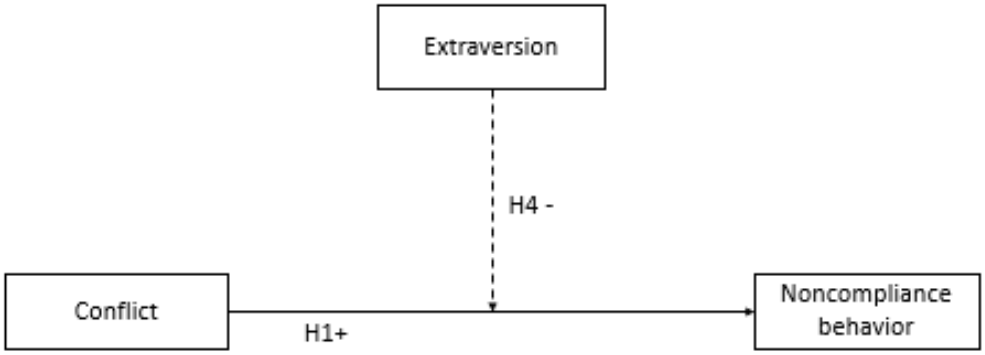

Figure 3 Research Model (Extraversion as moderator)

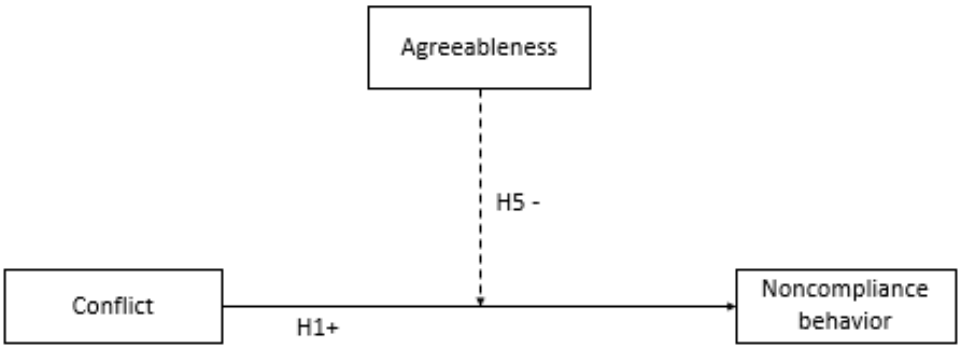

Figure 4 Research Model (Agreeableness as moderator)

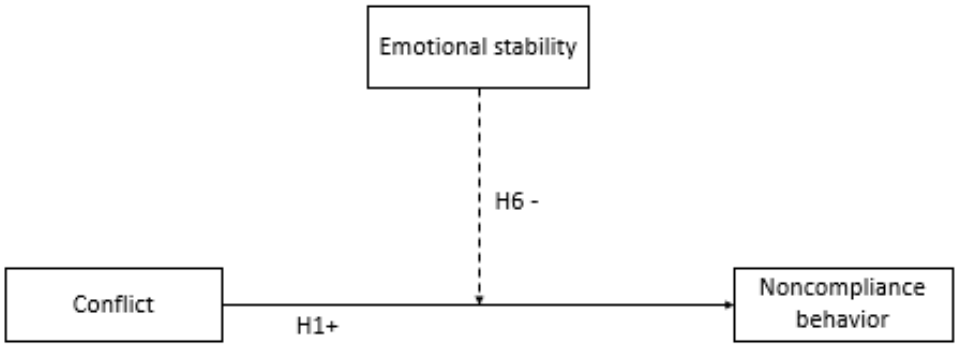

Figure 5 Research Model (Emotional stability as moderator)

Methods

Measures

Conflict was measured by the average of the scores of four conflict items (Nurbhai, 2014). The subjects were given conflict scenarios. We only used one of the scenarios for our calculation. The score of each of the four items was measured using a Likert-type scale with 1 being "very little" and 5 being "very much" to evaluate how much conflict each subject estimated.

The Big Five scores were obtained from Personality Recognizer, a program that calculates and outputs score of the Big Five personality traits from text ("Personality Recognizer," n.d.). The scale of the measures is from 1 to 7 with 7 being strong. Personality Recognizer is the product of Mairesse, Walker, Mehl, & Moore (2007). The authors followed the following steps in order to build the application:

1. Collect individual corpora;
2. Collect associated personality ratings for each participant;
3. Extract relevant features from texts;
4. Build statistical models of the personality ratings based on the features;
5. Test the learned models on the linguistic outputs of unseen individuals (Mairesse et al., 2007).

Mairesse et al. (2007) combine both LIWC (J. W. Pennebaker et al., 2001) and MRC (Coltheart, 1981) to build their predictive models. LIWC stands for Linguistic Inquiry and Word Count. It is "a transparent text analysis program that counts words in psychologically meaningful categories" (Tausczik & Pennebaker, 2010, p. 24). MRC is a "computerized database of psycholinguistic information" (Coltheart, 1981). Personality Recognizer was developed by (Mairesse et al., 2007) to predict the Big Five scores from text. Specifically, they used data science/machine learning to develop and validate their tool for assessing the personality traits articulated in the Big Five model.

Noncompliance was measured by the average of the scores of two noncompliance behavior items (Nurbhai, 2014).

Procedures

After getting the necessary IRB approvals, data were collected using Qualtrics. Each participant of this study was asked to write a real-life-experience essay. The subjects were given the choice of changing topics in their essays in the event that they did not have enough ideas. The reason for this was for them to be able to reach an acceptable number of words so that the Personality Recognizer algorithm would have enough input to predict the Big Five scores. In addition to the essay, the subjects were given two stories portraying a subordinate who conflicted with his/her supervisor (Nurbhai, 2014). The subordinate, who was in need of a new job, would use proprietary information of his/her current company for his/her own good. The subjects were asked to evaluate the action of the subordinate by answering questions. At the end of the survey, the subjects were given $10 participating in the experiment/study. In order to make the responses anonymous, each subject was assigned a random number between 1 and 300. That number was used as their survey identification (Each subject was asked to enter his/her assigned number at

the beginning of the survey). At the end of the survey, responses, which were integrated by Qualtrics, were downloaded as an Excel file. Using SPSS as statistical package, we applied moderation via PROCESS macro (Hayes, 2013) model #1.

Participants

The study was conducted at a major institution of higher education in the southern part of the United States. University students from any major or ethnicity were eligible to participate in the study. Each participant had to be 18 or older. Each subject received $10 as compensation for completing the survey. The subjects had the choice to withdraw from the survey at any time. They were informed that they would not be able to receive the compensation if they withdrew. They were also told that their responses would be kept confidential. In order to implement the confidentiality of the responses, each subject was assigned a random number (mentioned above) at the beginning of the survey session.

A total of 269 responses were collected out of which 13 were not used. The reasons were the age of the subjects (less than 18-year-old) or very short essays (responses with less than 1200 words were removed from the final analysis). Out of the participants, 54.1% were male and 45.90% were female. The minimum age was 18 and the maximum was 44. 91.45% of the participants were single, 6.32% were married, 0.37% were separated, 1.86% were divorced. 3.72% of the subjects were pursuing the associate degree, 88.85% were pursuing the bachelor's degree, 5.58% were pursuing the master's degree, and 1.86% were pursuing the PhD. 59.85% of the participants were not employed while 40.1% were. Among those who were employed, 46.30% had been employed for less than a year; 50% had been between 1 and 5 years; 1.85% had been between 6 and 10 years; 0.93% had been between 11 and 15 years; and 0.93% for 15 and more years. Still among the employed subjects, 21.30% were working full-time, 77.78% were working part-time,

and 0.93% were contractors. Regarding the salary of the employed subjects, 76.85% of them were earning less than $25,000 per year; 16.67% were earning between $25,000 and $50,000 per year; 4.63% were earning between $51,000 and $75,000 per year; 0.93% were earning between $76,000 and $100,000; and 0.93% were earning more than $100,000. Again, among the employed subjects, 7.41% were in upper management, 11.11% were in middle management, 11.11% were in lower management, and 70.37% were in non-management.

Demographic Information on the participants	
Category	Frequency
Gender	Male: 54.1%
	Female: 45.90%
Average Age	21
Marital Status	Single: 91.45%
	Married: 6.32%
	Separated: 0.37%
	Divorced: 1.86%
	Widowed: 0%
Education	Associate: 3.72%
	Bachelor: 88.85%
	Master: 5.58%
	PhD: 1.86%
Employment status	Yes: 40.1
	No: 59.85%
Employment Status	Full-time: 21.30%
	Part-time: 77.78%
	Contractor: 0.93%
Salary	<$25K: 76.85%
	$25-50K: 16.67%
	$51-75K: 4.63%
	$76-100K: 0.93%
	>$100K: 0.93%
Managerial role	Non-management: 70.37%
	Lower management: 11.11%
	Middle management: 11.11%
	Upper management: 7.41%
Percentages are estimated approximatively	

Table 1 Demographics of sample

Results

Openness as moderator

As seen in Table 2, conflict is negatively and significantly related to behavior (b = -0.196, p = 0.0089), after controlling for openness, the interaction between both openness and conflict, gender, and age. This is in contrast to our expectation that conflict would be positively associated with noncompliance behavior. However, the effect is significant. Openness is negatively and not significantly related to behavior (b = -0.1624, p = 0.4145) controlling for conflict, interaction between both openness and conflict, gender, and age. The interaction between both openness and conflict is negatively and not significantly related to behavior (b = -0.4118, p = 0.0836), after controlling for conflict, openness, gender, and age. This implies that there is not enough evidence to infer that openness has a moderating effect on the relationship between conflict and noncompliance behavior. Thus, hypothesis 2 is not supported. Gender is negatively and not significantly related to behavior (b = -0.1368, p = 0.2526) controlling for conflict, openness, the interaction between both openness and conflict, and age. Age is positively and not significantly related to behavior (b = 0.0005, p = 0.9704) controlling for conflict, openness, interaction between both openness and conflict, and gender.

In Table 3, conflict is negatively and not significantly (b = -0.0744, p = 0.4469) related to behavior at -1 standard deviation (for example at -0.2953) on the centered openness variable (low openness). Conflict is negatively and significantly (b = -0.196, p = 0.0089) related to behavior at mean (at 0) on the centered openness variable (medium openness). Conflict is negatively and significantly (b = -0.3176, p = 0.0031) related to behavior at +1 standard deviation (for example at 0.2953) on the centered openness variable (high openness). The results mean that hypothesis 1 is not supported as the effect of conflict is negative. However, there is

significance of the effect of conflict on noncompliance behavior at both medium and high level of openness.

Conscientiousness as moderator

As seen in Table 5, conflict is negatively and significantly related to behavior (b = -0.1979, p = 0.0078) controlling for conscientiousness, the interaction between both conscientiousness and conflict, gender, and age. As a result, hypothesis 1 is not supported because a positive relationship was expected. However, the effect is significant. Conscientiousness is negatively and not significantly related to behavior (b = -0.3012, p = 0.0888) controlling for conflict, interaction between both conscientiousness and conflict, gender, and age. The interaction between both conscientiousness and conflict is negatively and significantly related to behavior (b = -0.4715, p = 0.0203) controlling for conflict, conscientiousness, gender, and age. It means that there is moderating effect of conscientiousness on the relationship between conflict and noncompliance behavior which supports hypothesis 3. Gender is negatively and not significantly related to behavior (b = -0.1131, p = 0.334) controlling for conflict, conscientiousness, the interaction between both conscientiousness and conflict, and age. Age is positively and not significantly related to behavior (b = 0, p = 0.9998) controlling for conflict, conscientiousness, interaction between both openness and conflict, and gender.

In Table 6, conflict is negatively and not significantly (b = -0.0401, p = 0.6822) related to behavior at -1 standard deviation (for example at -0.3347) on the centered conscientiousness variable (low openness). Conflict is negatively and significantly (b = -0.1979, p = 0.0078) related to behavior at mean (at 0) on the centered conscientiousness variable (medium openness). Conflict is negatively and significantly (b = -0.3557, p = 0.0006) related to behavior at +1

standard deviation (for example at 0.3347) on the centered conscientiousness variable (high openness).

Extraversion as moderator

As seen in Table 8, conflict is negatively and significantly related to behavior (b = -0.1878, p = 0.0123) controlling for extraversion, the interaction between both extraversion and conflict, gender, and age. Consequently, hypothesis 1 is not supported because a positive relationship was expected. However, the effect is significant. Extraversion is negatively and not significantly related to behavior (b = -0.1072, p = 0.3925) controlling for conflict, interaction between both extraversion and conflict, gender, and age. The interaction between both extraversion and conflict is negatively and not significantly related to behavior (b = -0.2016, p = 0.1656) controlling for conflict, extraversion, gender, and age. That signifies that there is not enough evidence to infer that extraversion has a moderating effect on the relationship between conflict and noncompliance behavior. Hypothesis 4 is not supported as a result. Gender is negatively and not significantly related to behavior (b = -0.0762, p = 0.5205) controlling for conflict, extraversion, the interaction between both extraversion and conflict, and age. Age is negatively and not significantly related to behavior (b = -0.0026, p = 0.8436) controlling for conflict, extraversion, interaction between both openness and conflict, and gender.

Agreeableness as moderator

As seen in Table 9, conflict is negatively and significantly related to behavior (b = -0.1825, p = 0.0157) controlling for agreeableness, the interaction between both agreeableness and conflict, gender, and age. Hypothesis 1, consequently, is not supported because a positive relationship was expected. However, the effect is significant. Agreeableness is negatively and not significantly related to behavior (b = -0.0655, p = 0.7863) controlling for conflict, interaction between both agreeableness and conflict, gender, and age. The interaction between both

agreeableness and conflict is negatively and not significantly related to behavior (b = -0.3346, p = 0.2388) controlling for conflict, agreeableness, gender, and age. That does not support hypothesis 5 as a result. Gender is negatively and not significantly related to behavior (b = -0.0864, p = 0.4661) controlling for conflict, agreeableness, the interaction between both agreeableness and conflict, and age. Age is negatively and not significantly related to behavior (b = -0.0007, p = 0.9561) controlling for conflict, agreeableness, interaction between both openness and conflict, and gender.

Emotional stability as moderator

As seen in Table 10, conflict is negatively and significantly related to behavior (b = -0.2064, p = 0.0058) controlling for emotional stability, the interaction between both emotional stability and conflict, gender, and age. As a result, hypothesis 1 is not supported because a positive relationship was expected. However, the effect is significant. Emotional stability is negatively and not significantly related to behavior (b = -0.1736, p = 0.391) controlling for conflict, interaction between both emotional stability and conflict, gender, and age. The interaction between both emotional stability and conflict is negatively and significantly related to behavior (b = -0.681, p = 0.0051) controlling for conflict, emotional stability, gender, and age. Those results indicate that hypothesis 6 is supported. Gender is negatively and not significantly related to behavior (b = -0.1286, p = 0.2696) controlling for conflict, emotional stability, the interaction between both emotional stability and conflict, and age. Age is negatively and not significantly related to behavior (b = -0.0016, p = 0.8993) controlling for conflict, emotional stability, interaction between both openness and conflict, and gender.

In Table 11, conflict is negatively and not significantly (b = -0. 0104, p = 0.9131) related to behavior at -1 standard deviation (for example at -0.2879) on the centered emotional stability

variable (low openness). Conflict is negatively and significantly (b = -0.2064, p = 0.0058) related to behavior at mean (at 0) on the centered emotional stability variable (medium openness). Conflict is negatively and significantly (b = -0.4025, p = 0.0002) related to behavior at +1 standard deviation (for example at 0.2879) on the centered emotional stability variable (high openness).

Model (Moderation with openness as moderator)						
	coeff	**se**	**t**	**p**	**LLCI**	**ULCI**
constant	1.9562	0.2775	7.0498	0	1.4097	2.5027
Conflict	-0.196	0.0743	-2.6378	0.0089	-0.3423	-0.0497
Openness	-0.1624	0.1987	-0.8174	0.4145	-0.5538	0.2289
Int_1	-0.4118	0.237	-1.7373	0.0836	-0.8786	0.055
Gender	-0.1368	0.1193	-1.1466	0.2526	-0.3718	0.0982
Age	0.0005	0.0128	0.0371	0.9704	-0.0247	0.0256

Table 2 Model with openness as moderator

Conditional effects of the focal predictor at values of the moderator(s):						
Openness	**Effect**	**se**	**t**	**p**	**LLCI**	**ULCI**
-0.2953	-0.0744	0.0976	-0.7619	0.4469	-0.2666	0.1179
0	-0.196	0.0743	-2.6378	0.0089	-0.3423	-0.0497
0.2953	-0.3176	0.1064	-2.9858	0.0031	-0.5271	-0.1081

Table 3 Conditional effects of conflict at values of openness

Model (Moderation with conscientiousness as moderator)						
	coeff	**se**	**t**	**p**	**LLCI**	**ULCI**
constant	1.9462	0.2757	7.0581	0	1.4031	2.4892
Conflict	-0.1979	0.0738	-2.6824	0.0078	-0.3432	-0.0526
Conscientiousness	-0.3012	0.1763	-1.7085	0.0888	-0.6484	0.046
Int_1	-0.4715	0.2019	-2.3351	0.0203	-0.8692	-0.0738
Gender	-0.1131	0.1169	-0.968	0.334	-0.3433	0.1171
Age	0	0.0127	0.0003	0.9998	-0.0251	0.0251

Table 5 Model with conscientiousness as moderator

Conditional effects of the focal predictor at values of the moderator(s):						
Conscientiousness	**Effect**	**se**	**t**	**p**	**LLCI**	**ULCI**
-0.3347	-0.0401	0.0978	-0.41	0.6822	-0.2327	0.1525
0	-0.1979	0.0738	-2.6824	0.0078	-0.3432	-0.0526

0.3347	-0.3557	0.1023	-3.478	0.0006	-0.5572	-0.1543

Table 6 Conditional effects of conflict at values of conscientiousness

Model (Moderation with extraversion as moderator)						
	coeff	**se**	**t**	**p**	**LLCI**	**ULCI**
constant	1.9808	0.2791	7.0965	0	1.4311	2.5306
Conflict	-0.1878	0.0745	-2.522	0.0123	-0.3344	-0.0411
Extraversion	-0.1072	0.1251	-0.8565	0.3925	-0.3536	0.1393
Int_1	-0.2016	0.145	-1.3907	0.1656	-0.4871	0.0839
Gender	-0.0762	0.1185	-0.6435	0.5205	-0.3096	0.1571
Age	-0.0026	0.0129	-0.1976	0.8436	-0.028	0.0229

Table 8 Model with extraversion as moderator

Model (Moderation with agreeableness as moderator)						
	coeff	**se**	**t**	**p**	**LLCI**	**ULCI**
constant	1.9447	0.2795	6.9581	0	1.3943	2.4952
Conflict	-0.1825	0.075	-2.4313	0.0157	-0.3303	-0.0347
Agreeableness	-0.0655	0.2415	-0.2713	0.7863	-0.5411	0.41
Int_1	-0.3346	0.2834	-1.1809	0.2388	-0.8927	0.2235
Gender	-0.0864	0.1183	-0.73	0.4661	-0.3194	0.1466
Age	-0.0007	0.0129	-0.0551	0.9561	-0.0261	0.0247

Table 9 Model with agreeableness as moderator

Model (Moderation with emotional stability as moderator)						
	coeff	**se**	**t**	**p**	**LLCI**	**ULCI**
constant	2.0041	0.2793	7.1754	0	1.454	2.5542
Conflict	-0.2064	0.0741	-2.7845	0.0058	-0.3524	-0.0604
Emotional stability	-0.1736	0.202	-0.8593	0.391	-0.5714	0.2242
Int_1	-0.681	0.2411	-2.8245	0.0051	-1.1559	-0.2061
Gender	-0.1286	0.1162	-1.1064	0.2696	-0.3574	0.1003
Age	-0.0016	0.0129	-0.1267	0.8993	-0.027	0.0238

Table 10 Model with emotional stability as moderator

Conditional effects of the focal predictor at values of the moderator(s):

Emotional stability	Effect	se	t	p	LLCI	ULCI
-0.2879	-0.0104	0.0948	-0.1093	0.9131	-0.197	0.1763
0	-0.2064	0.0741	-2.7845	0.0058	-0.3524	-0.0604
0.2879	-0.4025	0.1079	-3.73	0.0002	-0.615	-0.19

Table 11Conditional effect of conflict at values of emotional stability

H	Hypothesis	Result
H1	Conflict will be positively related to noncompliance behavior	Not supported (significant, but the effect is different from what was hypothesized).
H2	The relationship between conflict and noncompliance behavior will be negatively moderated by openness	Not supported
H3	The relationship between conflict and noncompliance behavior will be negatively moderated by conscientiousness	Supported
H4	The relationship between conflict and noncompliance behavior will be negatively moderated by extraversion.	Not supported
H5	The relationship between conflict and noncompliance behavior will be negatively moderated by agreeableness	Not supported
H6	The relationship between conflict and noncompliance behavior will be negatively moderated by emotional stability	Supported

Table 13 Hypotheses summary

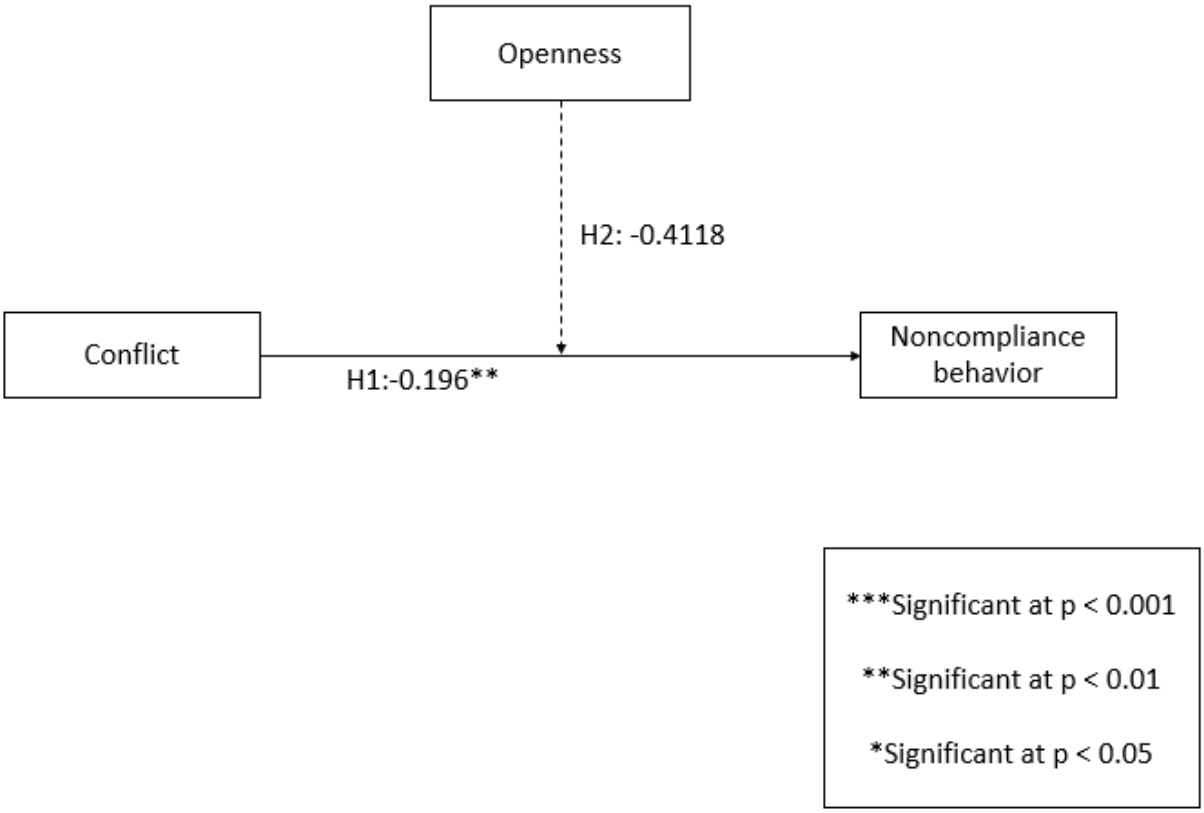

Figure 11 Results Model (with openness as moderator)

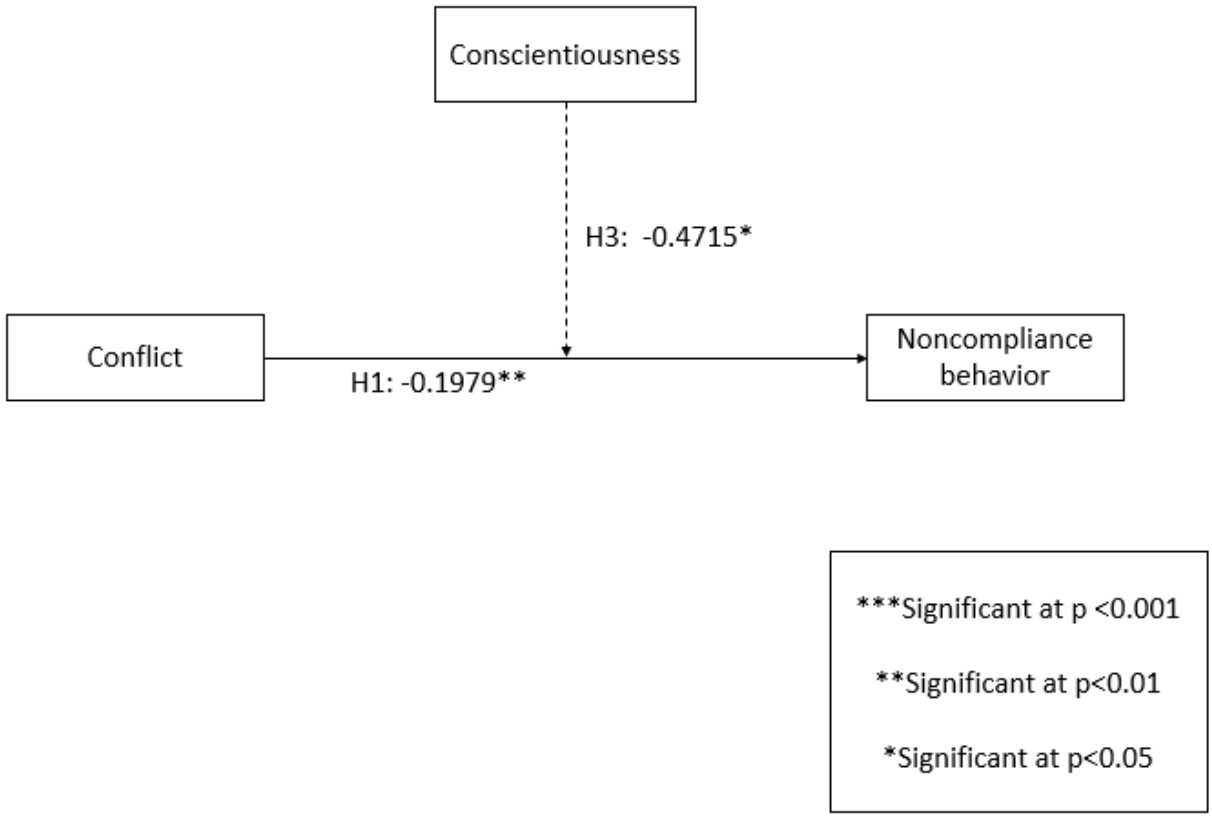

Figure 12 Results Model (with conscientiousness as moderator)

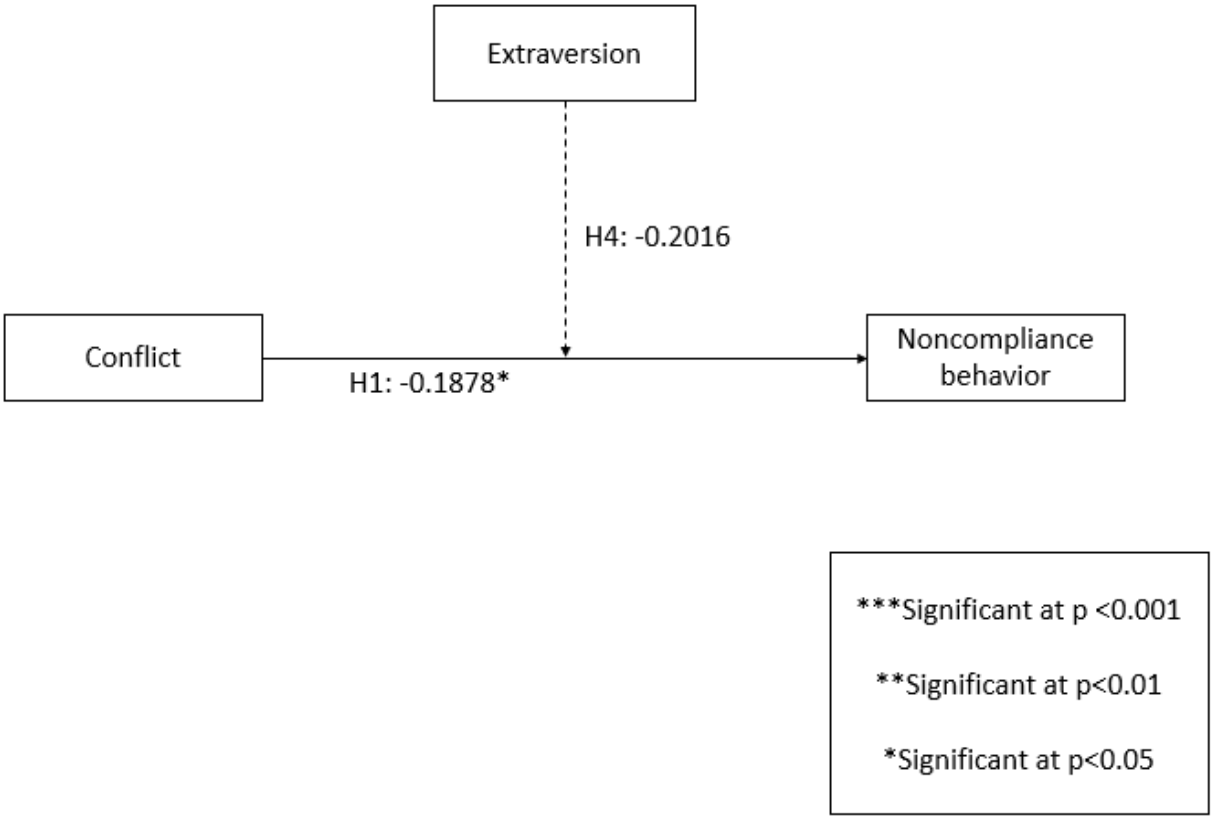

Figure 13 Results Model (with extraversion as moderator)

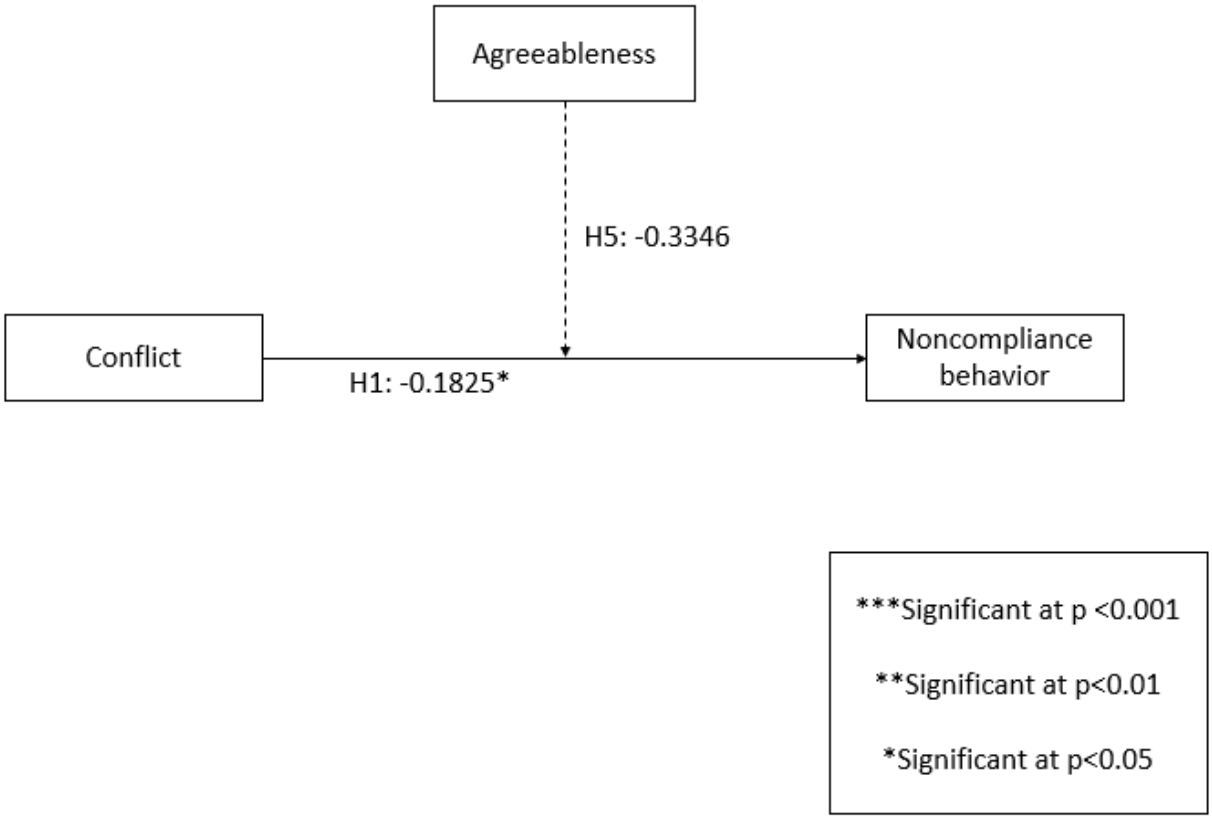

Figure 14 Results Model (with agreeableness as moderator)

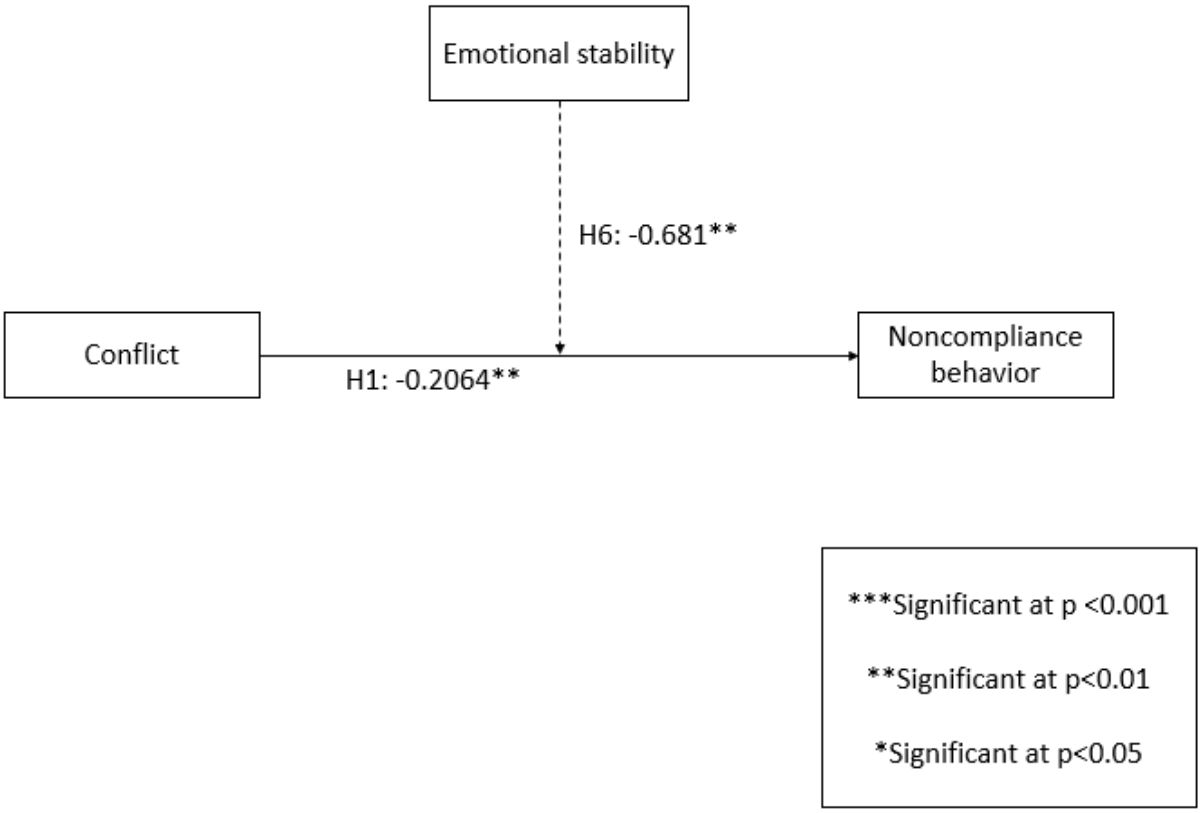

Figure 15 Results Model (with emotional stability as moderator)

Discussion

As seen in Table 13 showing the results summary, hypothesis 1 is not supported. The effect of conflict on noncompliance behavior is negative, but still significant. A plausible reason could be the content of the scenario given to the subjects. As a matter of fact, the scenario used in this study deals with a supervisor illtreating a subordinate. The latter, in search of a job in another company tends to use proprietary information of his current company to his advantage. Subjects may have been reluctant to approve such an act due to the fear of being prosecuted, laid off, or both.

Among the Big Five personality traits, only conscientiousness and emotional stability had a significant and negative moderating effect on the relationship between conflict and

noncompliance behavior. Intuitively, one of the aspects of being conscientious is to take everything seriously and respect the rules. At a certain extent, being conscientious could help with being ethical. Based on the scenario used in this study, deciding whether it would be appropriate to use proprietary information in one's company for one's own advantage could be considered an ethical situation. By being conscientious, one tends to act the right way; hence to be ethical. Being emotionally stable would also mean that one is able to be in control of one's emotions and to make decision with poise and calmness. Consequently, a person who would be highly and emotionally stable despite being in a situation as described in the scenario of this study, would be able to suppress any frustrating emotions and make a decent decision.

Key Findings and Contributions

One of the key findings is the fact that the effect of conflict on noncompliance behavior was significant and negative. As mentioned above in the discussion section, it might be due to the ethical aspect of the scenario. Moreover, both conscientiousness and emotional stability negatively moderated the relationship between conflict and noncompliance behavior.

This study adds to the body of literature on the effects of personality on compliance or noncompliance behavior. Specifically, our study reveals that both conscientiousness and emotional stability have inhibiting effects in the context of conflict and its effect on behavior. (Nurbhai, 2014) had found that anger control played a negative and moderating effect on the relationship between anger and information security policy violation. Both conscientiousness and emotional stability, consequently, could be also used as a substitute for anger control, as it also negatively moderated the relationship between conflict and noncompliance behavior. The plausible reason for this negative moderation, in the case of conscientiousness, is that a highly conscientious person would be meticulous about what should be normally expected to do in the

situation. Logically, the highly conscientious person would think about the fact that using proprietary information for his advantage, as a way to passively retaliate and consequently showing lack of consideration towards any possible repercussions of the act, would be somewhat wrong. He then would perceive the conflict with his supervisor as not having precedence over his mindset of following norms and rules. Regarding the negatively moderating effect of emotional stability, it might be due to the fact that the subordinate is able to suppress his feelings of frustration or anger to think more clearly about the situation and realize that the conflict would not necessarily mean that he would have to carelessly use proprietary information. He would then act wisely and might examine other ways to solve the issue with his supervisor, for example, by following the chain of command and talk to the manager higher ranked than his supervisor.

Another contribution of this study is the use of the personality inferring program (Personality Recognizer) from (Mairesse et al., 2007) for the computation of the Big Five measures. That is a practice that has been seldomly done to the extent that it has been the traditional Big Five questionnaire that has been heavily used to measure the scores of the five traits.

Limitations

One of the main limitations of the study is the use of student subjects from a university. Most of the subjects were in their early twenties and, therefore, our findings have to be interpreted keeping this in mind. The generalizability of our results may be improved by randomly drawing subjects rather than restricting participation to students of narrow age range that is not representative of the general population. Despite these limitations, we believe our study is useful approximation and a first step towards using text-inferred personality measures to study noncompliance behaviors.

Another limitation could be the choice of the scenario. By having chosen a less drastic behavior, that of using proprietary information for one's own advantage while looking for another job, the subjects would have probably been prone to be highly in favor of the noncompliance behavior. That would have probably changed the sign of the effect or relationship between conflict and noncompliance behavior which would have been in accordance with our first hypothesis.

Conclusion and Future Directions

The results of this study show that both conscientiousness and emotional stability moderate the relationship between conflict and noncompliance behavior. The relationship between conflict and noncompliance behavior was significant, but negative which is not expected. The plausible reason was the content of the scenario given to the subjects.

Future research may replicate our study under different conditions of conflict to gain deeper insight into the effects of personality on noncompliance behavior.

Another future direction for this study would be to use structural equation modeling to study the phenomenon described. The results could be then compared with those of this current study using composite scores as explained in the measures section.

One more future direction could be to include anger in the model as conflict could provoke anger which would then lead to noncompliance behavior (Nurbhai, 2014). The work would have been different from that of Nurbhai (2014) as the latter does not use the Big Five personality traits as moderators, but rather organizational justice and anger control.

Appendix A: Information Security Policies Survey

Q1 Please indicate your Gender

□ Male

□ Female

Q2 Please write your age

Q3 What is your marital status?

□ Single, never married

□ Married

□ Seperated

□ Divorced

□ Widowed

Q4 What degree are you currently pursuing?

□ Associate's

□ Bachelor's

□ Master's

□ PhD

Q5 What is your current major?

Q6 Are you currently employed?

□ Yes

□ No

Q7 How many years have you been at this company?

□ Less than one year

□ 1-5 years

□ 6-10 years

□ 11-15 years

□ 15+ years

Q8 What is your position at this company?

Q9 Are you a full time or part time employee?

□ Full-time

□ Part-time

□ Contractor

Q10 Are you a management or non-management employee?

□ Upper Management

□ Middle Management

□ Lower Management

□ Non-management

Q11 Before taxes, what is your annual income?

□ Less than $25,000

□ $25,000-$50,000

□ $51,000-$75,000

□ $76,000-$100,000

□ $100,000+

Q12 What is the size of your department?

□ 1-10 employees

□ 11-20 employees

□ 21-30 employees

□ 31-40 employees

□ 40+ employees

Q13 What is the size of your company?

□ 1-250 employees

□ 250-500 employees

□ 500-750 employees

□ 750-1,000 employees

□ 1,000+ employees

Q14 What industry does your company belong too?

□ Telecommunications

□ Manufacturing

□ Banking/Finance

□ IT Consulting

□ Retail

□ Healthcare

□ Government (City, State or Federal)

□ Defense Firm (i.e. Lockheed Martin, Raytheon, etc.)

□ Education

□ Media

□ Other

First scenario

Mike Jones is an employee working at a large defense company. Mike has been working at the organization for a year and is a candidate for a higher paying position that has just opened up. Mike's coworker, George, is also competing for that job. Due to this, George frequently withholds crucial information Mike needs in order to complete projects. Mike's organization employs a third-party mediator to resolve employee conflict; but the mediator assigned arbitrarily took George's side and discredited Mike's side of the argument. In hopes of finding a better job, Mike, over a two-week time span, begins to transfer classified, proprietary

information to his home computer. Mike intended to use the information as reference material in hopes of finding another job.

Q15 Please answer each of the following questions on a scale of 1 through 5, with one being “To a small extent” and five being “To a large extent”. If you feel that the question doesn't apply to the scenario, please write "Does Not Apply". The following items refer to the procedures used at Mike’s company in order to resolve conflict in the workplace. To what extent:

1. Has Mike been able to express his views and feelings during the conflict resolution?

2. Has Mike been able to influence the type of outcome arrived at by the conflict resolution?

3. Has the conflict resolution procedure been free of bias?

4. Has the conflict resolution procedure been based on accurate information?

Q16 Please answer the following questions on a scale of 1 through 5, with one being "to a small extent" and five being "to a large extent". If you feel that the question doesn't apply to the scenario, please write "Does Not Apply". The following items refer to the authority figure in charge of settling disputes inside Mike’s workplace. To what extent:

1. Has the authority figure treated Mike in a polite manner?

2. Has the authority figure treated Mike with dignity?

3. Has the authority figure treated Mike with respect?

4. Has the authority figure refrained from improper remarks or comments?

Q17 On a scale of one through five, with one being “Extremely Unlikely” and five being “Extremely Likely”, please answer the following question.

1. If you were Mike, what is the likelihood that you would have copied the proprietary information?

Q18 On a scale of one through five, with one being "Totally Unacceptable" and five being "Perfectly Acceptable", please answer the following question.

1. Mike's copying of the proprietary information was:

Q19 On a scale of 1-5, with one being “Very Little” and five being “Very Much”, please rate how much conflict there is in Mike’s workplace.

1. How much friction do you feel there is between Mike and George?

2. How much are personality conflicts evident between Mike and George?

3. How much tension is there between Mike and George?

4. How much emotional conflict is there between Mike and George?

Q20 On a scale of 1-5, with one being “Strongly Disagree” and five being “Strongly Agree”, please answer the following questions: Overall, I think Mike would feel...

1. Angry

2. Irritated

3. Burned Up

4. Furious

5. Like swearing

6. Like yelling at somebody

Appendix B: Essay Prompt

Directions

You are to provide an essay (written in a Word document) of at least 1200 words about your real-life experience (It could be anything you would like; bad experience, good experience, or both). You have to make sure that the level of English you are using is the regular one that you use in your daily life. The essay does not require any formal introduction, development, or conclusion. You can just separate each of your different entries by going to the next line. Your work should be single space, 0 point spacing before and after paragraphs. After essay completion, please verify that it has at least 1200 words (The number of words is located on bottom left side of the Word page), copy the essay, and then paste it into the provided cell from your Qualtrics survey.

N.B. Your essay should not contain your name (You will be asked to write your name in a separate question from the UTA Qualtrics surveys). Your name will strictly and only be used to match your responses from the first session survey (including the essay) and those from the second session survey. Except that matching step, your name will not have any other purpose.

Appendix C: Moderation Results

Conditional effect of focal predictor at values of the moderator:						
Openness	**Effect**	**se**	**t**	**p**	**LLCI**	**ULCI**
-1.5032	0.423	0.3577	1.1827	0.238	-0.2814	1.1274
-1.3669	0.3669	0.3261	1.125	0.2617	-0.2754	1.0092
-1.2306	0.3108	0.2947	1.0543	0.2927	-0.2697	0.8912
-1.0943	0.2546	0.2636	0.966	0.335	-0.2645	0.7738
-0.958	0.1985	0.2328	0.8528	0.3946	-0.2599	0.6569
-0.8217	0.1424	0.2024	0.7035	0.4824	-0.2562	0.541
-0.6854	0.0863	0.1727	0.4994	0.618	-0.2539	0.4264
-0.5491	0.0301	0.1442	0.2089	0.8347	-0.2539	0.3141
-0.4128	-0.026	0.1177	-0.221	0.8253	-0.2577	0.2057
-0.2765	-0.0821	0.0947	-0.8668	0.3869	-0.2687	0.1045
-0.1402	-0.1383	0.0787	-1.756	0.0803	-0.2933	0.0168
-0.1097	-0.1508	0.0766	-1.9695	0.05	-0.3016	0
-0.0039	-0.1944	0.0742	-2.619	0.0094	-0.3406	-0.0482
0.1324	-0.2505	0.0831	-3.0145	0.0028	-0.4142	-0.0868
0.2687	-0.3066	0.1019	-3.0081	0.0029	-0.5074	-0.1059
0.405	-0.3628	0.1263	-2.8712	0.0044	-0.6116	-0.1139
0.5413	-0.4189	0.1537	-2.7254	0.0069	-0.7216	-0.1162
0.6776	-0.475	0.1827	-2.6003	0.0099	-0.8348	-0.1152
0.8139	-0.5311	0.2126	-2.4981	0.0131	-0.9499	-0.1124
0.9502	-0.5873	0.2432	-2.4151	0.0164	-1.0662	-0.1084
1.0865	-0.6434	0.2741	-2.3472	0.0197	-1.1833	-0.1035
1.2228	-0.6995	0.3053	-2.2909	0.0228	-1.3009	-0.0981

Table 4 Conditional effects of conflict at values of openness

Conditional effect of focal predictor at values of the moderator:						
Conscientiousness	**Effect**	**se**	**t**	**p**	**LLCI**	**ULCI**
-1.1838	0.3602	0.247	1.4586	0.1459	-0.1262	0.8466
-1.0196	0.2828	0.2155	1.3121	0.1907	-0.1417	0.7073
-0.8554	0.2054	0.1847	1.1118	0.2673	-0.1584	0.5692
-0.6912	0.128	0.1549	0.8261	0.4095	-0.1771	0.433
-0.527	0.0505	0.1267	0.3988	0.6903	-0.199	0.3001
-0.3628	-0.0269	0.1016	-0.2645	0.7916	-0.227	0.1732
-0.1986	-0.1043	0.0824	-1.2662	0.2066	-0.2665	0.0579
-0.1033	-0.1492	0.0758	-1.9695	0.05	-0.2984	0
-0.0344	-0.1817	0.0738	-2.4623	0.0145	-0.3271	-0.0364
0.1298	-0.2591	0.0794	-3.2633	0.0013	-0.4155	-0.1027
0.294	-0.3366	0.0968	-3.4779	0.0006	-0.5271	-0.146
0.4582	-0.414	0.1209	-3.4236	0.0007	-0.6521	-0.1758
0.6224	-0.4914	0.1486	-3.3072	0.0011	-0.784	-0.1988

0.7866	-0.5688	0.1781	-3.1932	0.0016	-0.9196	-0.218
0.9508	-0.6462	0.2088	-3.0955	0.0022	-1.0574	-0.2351
1.115	-0.7237	0.2401	-3.0143	0.0028	-1.1965	-0.2508
1.2792	-0.8011	0.2718	-2.9471	0.0035	-1.3364	-0.2657
1.4434	-0.8785	0.3039	-2.8911	0.0042	-1.477	-0.28
1.6076	-0.9559	0.3361	-2.8439	0.0048	-1.6179	-0.2939
1.7718	-1.0333	0.3685	-2.8038	0.0054	-1.7592	-0.3075
1.936	-1.1108	0.4011	-2.7694	0.006	-1.9007	-0.3208
2.1002	-1.1882	0.4337	-2.7395	0.0066	-2.0424	-0.334

Table 7 Conditional effects of conflict at values of conscientiousness

Conditional effect of focal predictor at values of the moderator:						
Emotional stability	**Effect**	**se**	**t**	**p**	**LLCI**	**ULCI**
-0.9313	0.4278	0.2272	1.8831	0.0608	-0.0196	0.8752
-0.8406	0.366	0.2066	1.7716	0.0777	-0.0409	0.7729
-0.7499	0.3043	0.1863	1.6329	0.1037	-0.0627	0.6713
-0.6592	0.2425	0.1665	1.4568	0.1464	-0.0853	0.5703
-0.5685	0.1807	0.1472	1.2281	0.2205	-0.1091	0.4706
-0.4778	0.119	0.1287	0.9245	0.3561	-0.1345	0.3724
-0.3871	0.0572	0.1114	0.5133	0.6082	-0.1623	0.2767
-0.2964	-0.0046	0.0961	-0.0475	0.9621	-0.1938	0.1847
-0.2057	-0.0663	0.0837	-0.7926	0.4288	-0.2312	0.0985
-0.115	-0.1281	0.0757	-1.692	0.0919	-0.2772	0.021
-0.0879	-0.1466	0.0744	-1.9695	0.05	-0.2931	0
-0.0243	-0.1899	0.0736	-2.5798	0.0105	-0.3348	-0.0449
0.0664	-0.2516	0.0778	-3.2331	0.0014	-0.4049	-0.0983
0.1571	-0.3134	0.0875	-3.582	0.0004	-0.4857	-0.1411
0.2478	-0.3752	0.101	-3.7131	0.0003	-0.5742	-0.1762
0.3385	-0.4369	0.1171	-3.7304	0.0002	-0.6676	-0.2062
0.4292	-0.4987	0.1349	-3.6981	0.0003	-0.7643	-0.2331
0.5199	-0.5605	0.1537	-3.6477	0.0003	-0.8631	-0.2579
0.6106	-0.6222	0.1732	-3.5932	0.0004	-0.9633	-0.2812
0.7013	-0.684	0.1932	-3.5405	0.0005	-1.0645	-0.3035
0.792	-0.7458	0.2136	-3.4917	0.0006	-1.1664	-0.3251
0.8827	-0.8075	0.2342	-3.4476	0.0007	-1.2689	-0.3462

Table 12 Conditional effect of conflict at values of emotional stability

Appendix D: Interaction Graphs

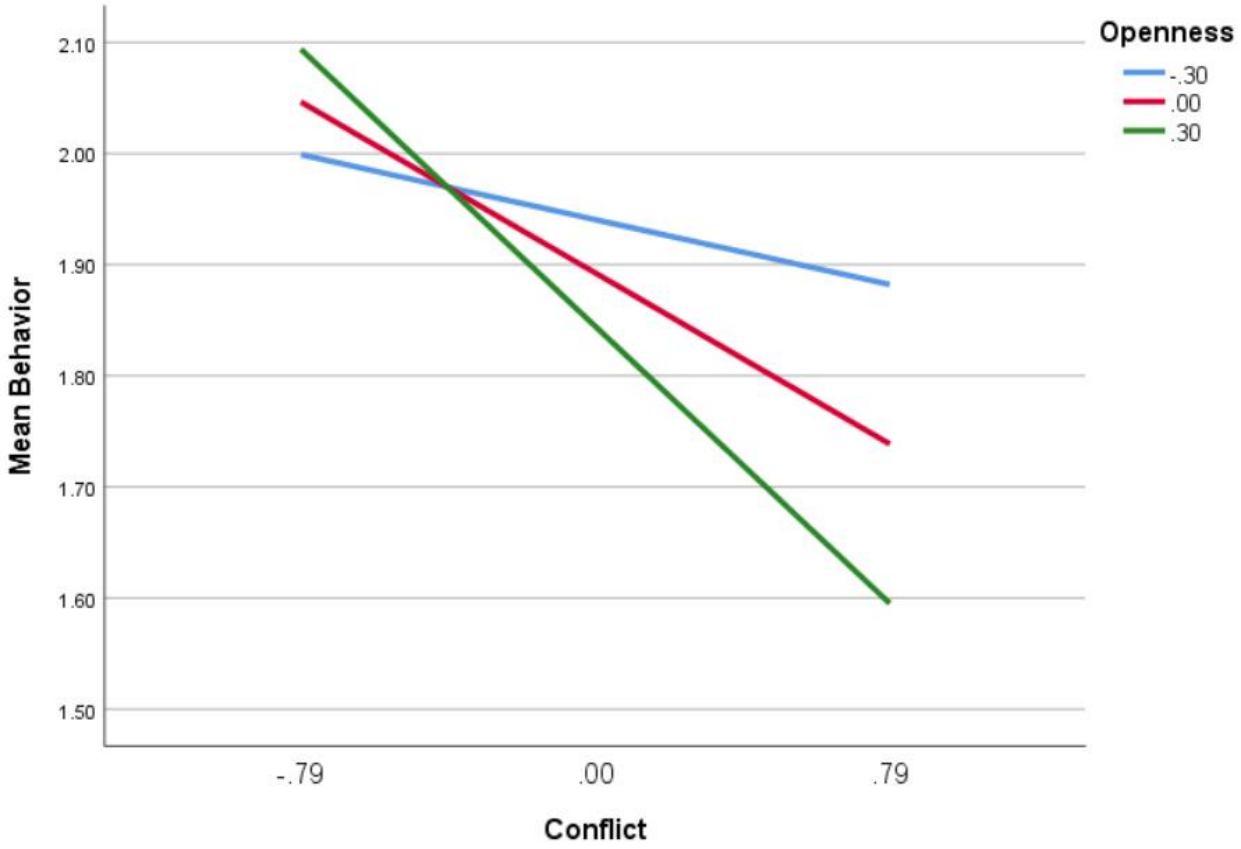

Figure 6 Interaction graph (Openness as moderator)

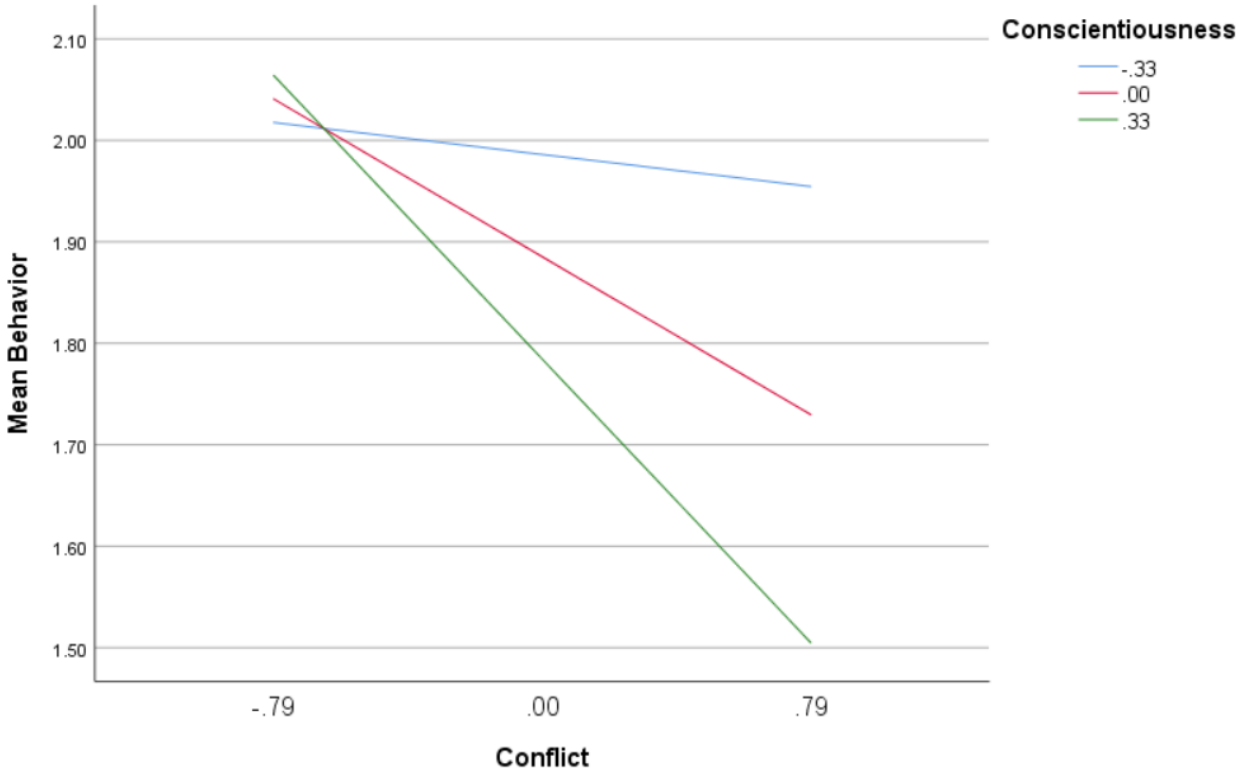

Figure 7 Interaction graph (Conscientiousness as moderator)

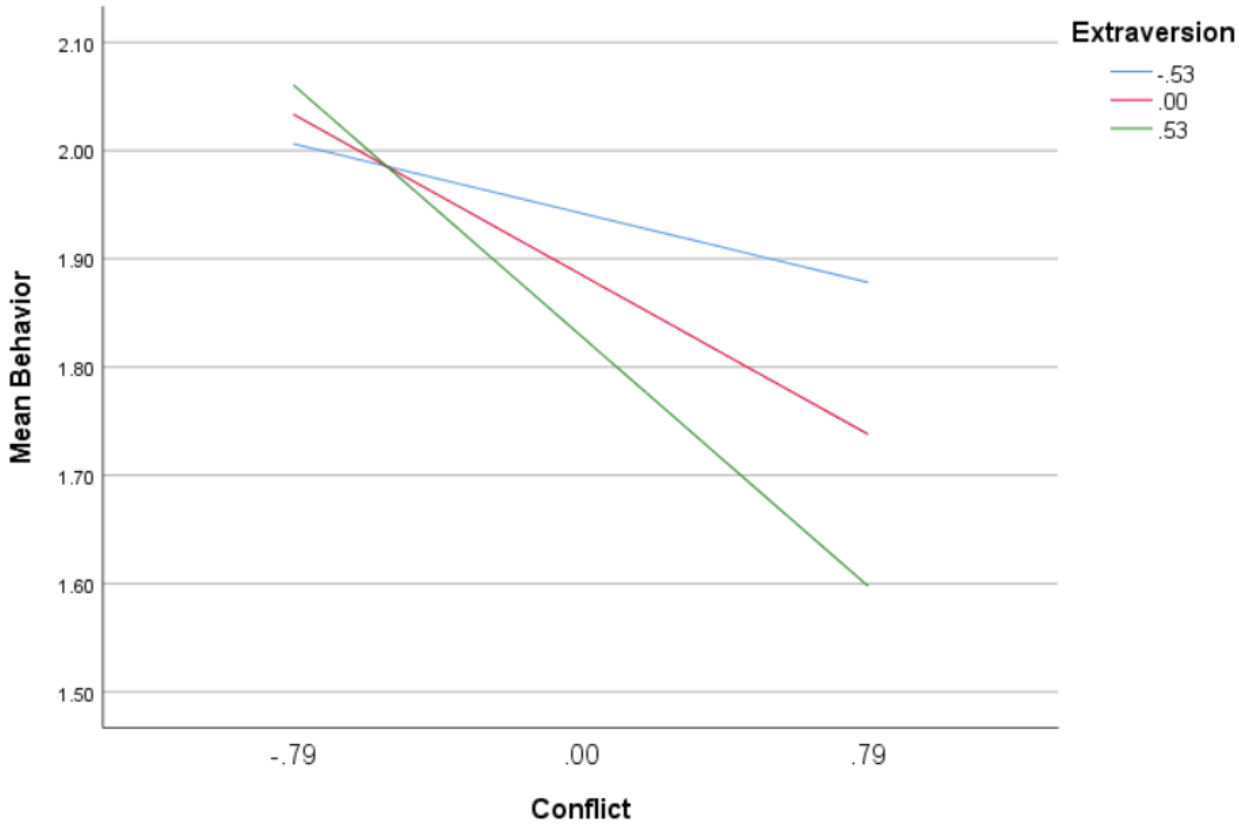

Figure 8 Interaction graph (Extraversion as moderator)

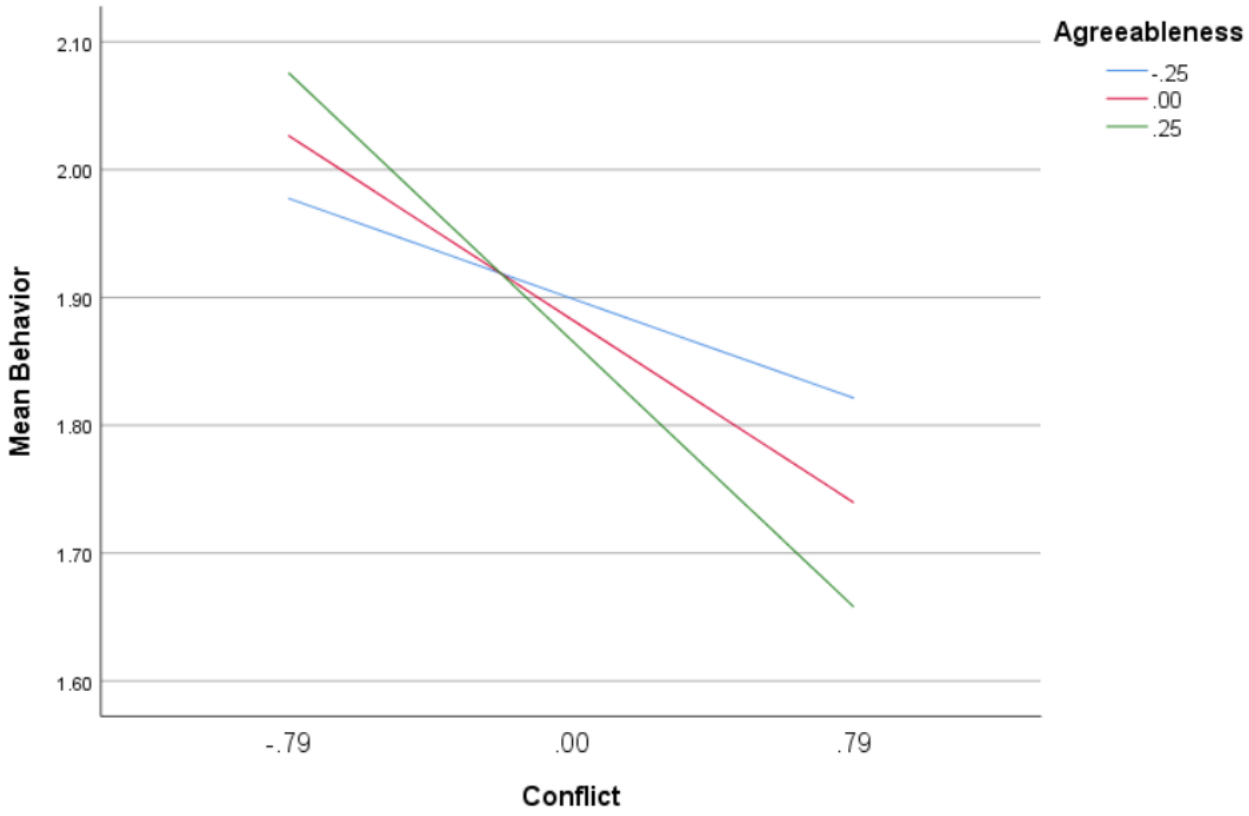

Figure 9 Interaction graph (Agreeableness as moderator)

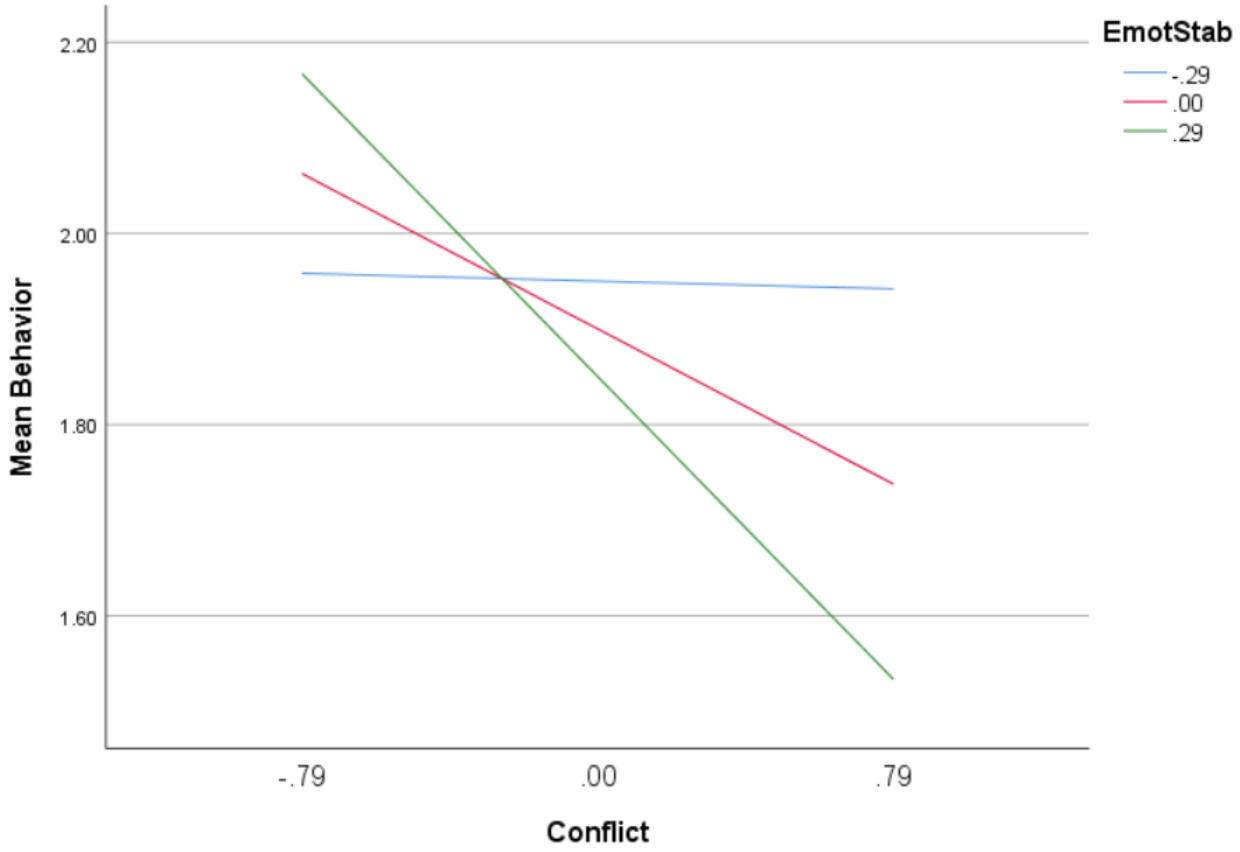

Figure 10 Interaction graph (Emotional stability as moderator)

Chapter 5: General Conclusion

This dissertation involved three empirical studies that relied on deriving personality measures (specifically, the Big Five Factors) from written text. The first study endeavored to compare personality characteristics derived from text with those obtained through a traditional quetionnaire. Three different APIs/software were used to extract personality characteristics from text. The results showed that there were significant differences among the different Big Five assessments. Significant similarities were found between both the Traditional Questionnaire and IBM Watson Personality Insights for the extraversion measures and between both Indico and Personality Recognizer for the openness measures. The differences found do not signify that some of the assessments are right while others are wrong. It could just signify that some may be more accurate than others. Both Personality Recognizer and IBM Watson Personality Insights could be used in by scholars measuring their constructs with Likert scales of 1 to 7 or range of 0 to 1. That would be to keep consistency in the measures of all constructs. In that case, for example a scholar using constructs measured with the Likert scale of 1 to 7 could use Personality Recognizer and those using construct measured between 0 and 1 could use IBM Watson Personality Insights. Indico, however, would be the assessment less likely to be used because it did not provide the scores for neuroticism or emotional stability. In addition, based on the fact that the Traditional Questionnaire has already been validated, we could infer that services similar to it should be the most accurate. For this, IBM Watson Personality Insights could be used if the trait of interest is extraversion. That is because both the Traditional Questionnaire and IBM Watson Personality Insights were found to show similarities for extraversion. As future directions, subjects could be asked to self-report and designate the service that most accurately indicate their Big Five traits.

The second study investigated the relationships between software-derived personality characteristics and prosocial moral reasoning as well the association between the latter (i.e., prosocial moral reasoning) and the propensity to help. The results of the second study only supported three of our hypotheses. As anticipated, prosocial moral reasoning was positively related to propensity to help. The study also found that conscientiousness was positively related to propensity to help. Finally, emotional stability was found to be positively related to propensity to help. Gender was also significantly and negatively related to prosocial moral reasoning for conscientiousness, extraversion, agreeableness, and emotional stability.

Regarding the third study, the results showed that the relationship between conflict and noncompliance behavior is negatively moderated by conscientiousness. It could be explained by the fact that being conscientious means not taking things lightly, but rather seriously. Seeing the context of conflict given in the scenario, a person (high in conscientiousness) might think about potential repercussions after using the proprietary information at his advantage. He might think about the plausibility of being laid off if he were to be caught. Another thought would be to wonder what the new employer would do if it were to know that the employee was laid off for having used proprietary information. In such a situation, the employee might think that his new employer would not hire him because he could be assumed to act similarly later The results of this third study also showed that the relationship between conflict and noncompliance behavior is negatively moderated by emotional stability. Emotional stability could be considered control. For example Nurbhai (2014) used anger control as moderator of the relationship between conflict and noncompliance behavior. Emotional stability, consequently, could be a substitute for anger control. If you are emotionally stable, it means that you have the capabilities to suppress extra level of emotion and to keep calm and poised. It is through this calmness and poise that you are

able to think and make well thought decision rather than precipitated decision due to anger or lack of control.

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