8-7-2017

Language as a Cognitive Frame for Personality

Alexander Ray Marbut

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Honors Capstone

by

Alexander Ray Marbut

An Honors Capstone

submitted in partial fulfillment of the requirements for the Honors Diploma

to

The Honors College

of

The University of Alabama in Huntsville

August 07, 2017

Honors Capstone Director: Dr. Eric Seemann

Associate Professor of Psychology

alex marbut   08/07/17
_____
Student   Date

                   8/7/17
_____
Director   Date

      for J. Neuschatz 8/7/17
_____
Department Chair   Date

                  8/7/17
_____
Honors College Dean   Date

Honors College
Frank Franz Hall
+1 (256) 824-6450 (voice)
+1 (256) 824-7339 (fax)
honors@uah.edu

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Alex Marbut
Student Name (printed)

alex Marbut
Student Signature

08/07/17
Date

Abstract

Personality is a combination of cognitive structures and external behaviors that extend from them that is relatively consistent over time and resistant to change. However, studies have shown that it may exist connected to cognitive structures and activate in different ways based upon external cues that activate these cognitive structures. The present study investigates the relationship between language and personality and seeks to verify the phenomenon of cultural frame switching, cultural accommodation theory, and the primary investigator's theory that syntactic structure influences cognitive structures which in turn influence personality as a higher order construct. 25 foreign language students from across the United States completed a survey constituted by a sample reading language prime, two personality measures, and a biographical questionnaire as a validity check. The main hypothesis is that groups separated by language will be distinguished by their personality scores. French and German students scored higher in Openness than the expected mean of the population, and Spanish students scored higher in Openness, Agreeableness, Conscientiousness, and Extroversion than the expected mean of the population. These results provide support for each the aforementioned theories and hypothesis.

Keywords: language, personality, five factor model, syntax, cultural accommodation theory, cognitive frame switching

Language as a Cognitive Frame for Personality

Introduction

Personality is basically defined as a consistent pattern of behavior, attitudes, thoughts, and feelings. It is rooted in many cognitive structures, and while a key part of personality is its consistency if changes in these cognitive structures occurs corresponding changes in personality could be the result. It is obvious that significant life changes such as the loss of a loved one could yield changes in personality. For many, the loss of a particularly close family member could permanently shift affect downward, making that person more melancholy or even pessimistic. As well established as this might be (Common Cold Project, 2011), it is intuitive. However, there may be other more subtle and unconsidered variables that influence our personality development and changes that might take place in it.

There is a wealth of literature that demonstrates that culture is a determining factor in personality development. Culture is like the personality of a society. It, too, is composed of a variety of variables. History, music, architecture, art, environment, culinary interests, politics, and language are all facets of culture. Each of these are distinct and influential to one's culture and, subsequently, one's personality. However, upon visiting a foreign culture it not difficult to note that language is one of a culture's most immediately potent artifacts. With that consideration in mind, it is hard to imagine why there is a dearth of literature investigating language's effects on personality. It is possible that any of the aforementioned facets of culture could influence personality all its own apart from culture, and language is possibly one of the most potentially robust considerations among these. Language is a crucial part of cognitive functioning: we think using language; it is an inescapable part of everyday life. As such, it is easy to imagine that language could influence personality, as it is grounded in cognition.

In addition considering what factors influence personality, it is important to consider the form in which these factors exist. Considering an individual's personal history, for instance, it is easy to intuit that such a factor is relatively unchanging. A person's past is just that: it is a fixed variable. However, there may exist other variables that are subject to change. Affect is a prime example. A person may be surly one day but cheerful the next depending on the most readily accessible external cues surrounding him or her. A song playing on the radio may remind one of a past relationship and ruin one's day while a favorite meal might generate positivity that lasts for hours. If external cues can change affect, it is possible that they can mediate other cognitive structures, as well. If external cues can mediate other cognitive structures, it is possible that they could activate varying dimensions of the personality that those cognitive structures composes. The present study seeks to investigate whether or not language is one of those factors.

Literature

The Five Factor Model of Personality

In order to scientifically investigate personality, the present study used scales measuring personality based on the Five Factor Model (FFM). This is a scientific model for personality that has been rigorously tested (McCrae & John, 1992). Based in trait theory, the FFM proposes that there are five central factors that describe personality as a whole in each individual: Neuroticism, Extroversion, Openness, Agreeableness, and Conscientiousness. According to this model, each person scores at some point along a spectrum of these five factors, and that is a global description of that person's personality.

The first of these five factors is Neuroticism. Neuroticism is a negatively framed personality factor if for no other reason than due to its name (McCrae & John, 1992), but like the other four it is adaptive. It is simply a ranking of how intense one's affect is. It is typically

known as a measure of negative affect, but perhaps it is more accurate to describe it by its alternate name and inverse: Emotional Stability. People who score high on Neuroticism are more prone to feeling all of their emotions in a very robust way. They get happier than most when they are happy, and they get sadder than most when they get sad. By contrast, people who score low on Neuroticism are more tranquil. They experience a full range of emotions, but not as intensely as a high scorer. They may feel angry but they rarely become furious, and they may feel jolly but they rarely feel ecstatic. Their personalities, in terms of affect, are more stoic and constant.

The second factor is Extroversion. Conventionally, this personality trait is known as a measure of sociability, but Extroversion by the standards of the FFM is far more (McCrae & John, 1992). People who score high on Extraversion are not only more outgoing than most people: they are also more energetic, assertive, enthusiastic, expressive, and excitement seeking. By contrast, people who score low on Extroversion are not only shy and reclusive: they are less energetic, passive, less excitable, less expressive, and prefer to stay at home. As a final note on Extraversion, displays of warmth are an additional characteristic of people who score high in this factor. Conversely, those who score low show less warmth. As distinct from Neuroticism, it may be best to interpret this as warmth coming from sociability and energy rather than affect.

The third factor is Openness. Though it is generally referred to by this term, it is also called such names as Openness to Experience, Intellect, Intellectance, and Imagination (McCrae & John 1992). It is a more difficult factor to name because there is not a word in English that truly captures its significance and breadth. This factor is a measure of one's intellectual curiosity, permeability to ideas, interest in diversity, creativity, ability to fantasize, and sensitivity to art and beauty. It is more accurate to call this factor "Intellectance" as opposed to "Intellect" because the latter name could make it easily confusable with Intelligence, another psychological

construct. Openness is distinct from Intelligence in that it is not related to one's actual

Intelligence Quotient (IQ) score. One could have an abnormally high IQ while scoring very low

on Openness, and conversely one could have an abnormally low IQ while scoring very high on

Openness. It is more accurate to say "Intellectance" because Openness is a tendency toward or

attraction to reflection and the abstract: it is the inclination toward intellectual things. Such a

predisposition does not by itself make one intelligent. Those who score high on Openness crave

novelty, are highly introspective, imaginative, insightful, and generally concerned with abstract

ideas. They are likely to often be "lost in thought," have a wide range of interests, find beauty

and inspiration in anything, and have a personality that is like a sponge, soaking up everything

around it. Those who score low in Openness are more likely to be realists. They are more likely

to prefer one kind of music, one kind of food, take the same paths to and from work every day,

and avoid places like museums.

The fourth factor is Agreeableness. Like Extraversion, this is another social trait (McCrae

& John, 1992). To compare the two, this factor is a measurement of one's ease of sociability

rather than one's tendency toward it. Those who score high on Agreeableness are more passive.

In layman's terms, they are the archetypal "Yes-people." They are likely to assent to doing what

they are asked or told to do, and they are forgiving, generous, kind, trusting, altruistic, giving,

and unquestioning. Those high on this factor are generally likeable people who are unwilling to

start conflict and who dislike it. In contrast, those who score low on this factor are more likely to

be hostile, require things to go their way, demanding, untrusting, critical, and rebellious.

The final factor is Conscientiousness. This factor includes two basic measurements: the

quotidian and the moral. Considering the first, those who score high in Conscientiousness are

more likely to be well-organized, efficient, dutiful, productive, responsible, and achievement-

striving. They have high aspirations, have natural leadership skills, are able to delay gratification, and are quite thorough. In contrast, those who score low are unambitious, disorganized, generally unreliable, and undisciplined people who tend to be self-indulgent, compulsive, and disorderly. They do not plan well. In addition, Conscientiousness is a measure of moral tendencies. Those who score high in this factor are also more likely to abide by the law. They can be seen driving the speed limit and maybe a few miles under it. They place a large value on order. These people are also motivated to do what they believe is the right thing to do. Those who score low in Conscientiousness are less likely to care about legal or moral codes in their decision making processes. They are more likely to use drugs or cheat. This trait is particularly notable in that it is used by employers as a predictor of employee performance.

In summary, the FFM consists of five factors that are used to describe an individual's personality. These factors are relatively consistent over time, resistant to change, and are adaptive. Though they are often misused as such, they are not spectrums of good and evil, and it is not any morally better to score higher or lower on any of these factors. They develop naturally, and they are not pathological. These factors are composed of the facets used above to describe them (McCrae & John, 1992). However, one's score on each factor does not inform one about one's score on each facet. It is possible to score moderately high in Conscientiousness due to extremely high moral values while having low scores in organization, forethought, and discipline. In addition, factors may interact to yield lower-level personality characteristics. For instance, one could have an average score on Agreeableness but still be described as being critical due to high Conscientiousness (value for order, ethical behavior) and high Extroversion (dominance, expressive). Such a person would not be more likely than anyone else to be compliant, but he or she would have strong opinions and would ensure that they were known.

While there is a surprising lack of research on the relationship between language and personality, there are a number of studies that investigate it as a cultural artifact related to personality. These studies support the phenomenon of cultural frame switching, the idea that there are separate cognitive structures that store cultural information and that, should these frames be activated, cognitions (and, thus, personality characteristics) that are stored with those frames will also be activated (Ramírez-Esparza, Gosling, Benet-Martínez, Potter, & Pennebaker, 2006). These studies also support the cultural accommodation hypothesis, the theory that a person will conform to the norms and expectations of the culture that language allows him or her cognitive access to, thus generating a change in personality expression (Chen & Bond, 2010).

Language and Personality

It is possible that bilinguals possess two personalities that are activated through cognitive frame switching when language is used as a prime. Ramírez-Esparza et al. (2006) investigated whether or not bilinguals are observed to alter their personalities based on language of response to questionnaires administered in either English or Spanish. They found that responses in English tended to score higher on Extroversion, Agreeableness, and Conscientiousness, whereas responses in Spanish tended to increase Neuroticism and Openness. These results do not undermine past research on personality as being a stable construct that persists across time and situations, they merely support a new description of personality as being a construct that is stored in separate cognitive structures and activates alongside them. A significant life event, such as a promotion, may increase one's Conscientiousness due to a plethora of new responsibilities and pride in one's work, but if one previously scored moderately on Conscientiousness that person would still not be as conscientious as that person's neighbor who scored high in Conscientiousness.

It has been shown that an individual's expression of self is dependent upon external social cues. Chen & Bond (2010) investigated the validity of the cultural accommodation hypothesis, theorizing that the need to behave congruently with one's external cues (e.g. social context) serves as a motivation to express different aspects of one's personality. The investigators defined two key terms for research on bilingual individuals. Coordinate bilinguals are those who learn their two languages in separate environments (e.g. a person who learns English in the United States but travels to Germany to for a lengthy business venture and there learns German). Compound bilinguals are those who learn their two languages in the same cultural context (e.g. foreign language students learning a second language in their own country). Chinese participants were interviewed in English or in Chinese, and their personality dispositions were measured. Differences in expression were greater for observer ratings than for self-ratings. When speaking with a Chinese interviewer, participants scored higher in Extroversion, Openness, and Assertiveness when speaking English as opposed to Chinese. However, language differences were not significant when Western interviewers were used. This means that the presence of an English speaking person was enough to prime Western personality characteristics and, thus, cultural accommodation whether the interview was conducted in English or in Chinese. In contrast to the first result, this phenomenon supports a socio-cultural prime rather than a language prime. However, such findings to not discount language as a prime for personality change. Many factors determine personality expression, and it is likely that socio-cultural primes are often more robust than subtle language cues. Nonetheless, that does not mean that language cannot serve as a significant prime.

Further research exists that suggests that bilinguals have two distinct personalities that can be accessed through language priming. Ervin (1964) conducted a set of Thematic

Apperception Tests (TATs). French coordinate bilinguals told stories about the same pictures in two sessions, one in English and one in French. Ervin assessed a number of cognitive structures related to the FFM, all prior to the acceptance of the FFM achieved in the 1990's (McCrae & John, 1992): achievement, importance of recognition by others, domination by elders, withdrawal and autonomy, verbal aggression towards parents and peers, physical aggression, and responsibility. Ervin (1964) found that achievement themes were more common in English in women while verbal aggression against age peers and autonomy and withdrawal from others were more common in French. This suggests that language affects memory and the organization of stimuli. She found that bilinguals have systematically different patterns of recall when one language is used over another. Ervin suggested that cognitive structures primed through language could include culturally differing variables such as mass media productions, differences in verbal preoccupations and values expressed. She also suggested that one's experiences in the settings in which each language was respectively used could be primed. In addition, she suggests that due to the different contexts in which bilinguals use their two languages, the use of one over the other could be observed with a number of changes in behavior. Ahead of her time, Ervin suggests in her own words that she was uncertain whether or not her observations were due to biculturalism or cultural frame switching. The purpose of the present study is to provide further evidence for the clarification of this issue.

Some studies demonstrate results contrary to those found by the above articles in support of cultural frame switching and cultural accommodation. Yang & Bond (1980) conducted a study in which Chinese students completed a survey in Chinese or English assessing their identification with Chinese or Western practices. Surprisingly, higher levels of Chinese identification were found for those completing the survey in English rather than in Chinese. The

results of this study emphasize the importance of another factor relevant to personality expression: ethnic salience. When one is made aware of one's own ethnicity, one reacts in ways that correspond to expectations for that ethnicity. As such, in this case completing the survey in English reminded the participants that they were Chinese, and as such their responses shifted in the Chinese direction. It is important to note that in this study 75% of participants received secondary schooling in English. Thus, English would be cognitively stored with Chinese cultural cognitions for these compound bilinguals. This demographic may make ethnic awareness more likely in Yang and Bond's sample. Nonetheless, this study does provide a counterexample to the aforementioned studies in support of language priming in the direction of the cultural relevant to that language. It seems that ethnic awareness and cultural accommodation counteract each other; ethnic awareness increases cognitions relevant to one's own culture whereas cultural accommodation increases cognitions relevant to the other's culture. It is important that future research investigate the effects of language by itself, separate from these two, in order to provide further clarification in regards to the nature of these variables. This study demonstrates that language can have different effects based on participants' contexts, and it demonstrates effects that work against cultural accommodation. Still, it does not address language itself as a regulator of cognitive structures.

The dearth of research investigating the direct relationship between language and personality is shocking. Research shows that language is a robust driver of cognitive change. Swain & Lapkin (2011) conducted a case study as a part of a larger project of the same nature that demonstrated that the use and production of language, which they call *languaging,* can reduce cognitive impairment in the elderly. An elderly woman, referred to only as Alise, was an elderly woman with mild cognitive impairment (MCI). Swain and Lapkin theorized that

language controls higher order mental processes, stabilizing abstract ideas, and drives cognitive development through its internalization. In their theory, language is an agent in the creation, a regulator of, and a mediator of cognition. In contrast to other studies mentioned here, these are the only researchers who suggest that language is not just a mediator but a regulator of cognition. They found that, as Alise and her interviewer spoke through an increasing number of sessions, she was able to attain a higher level of control over the details and sequence of events in her stories: a level that she may have not reached otherwise due to her social isolation. Language led to the internalization of her story, as each articulation that she made served as a stepping stone to the next point in the story that she was telling. Each further point was observed to be more elaborate and clear. In other words, each telling was a cognitive artifact that affected the next telling in the next session. Over time, Alise began to drive the conversation herself. This is a robust observation, as in the beginning sessions the interviewer did most of the talking. Her stories became more coherent, sophisticated, and lexically rich over time. These observations demonstrate cognitive enhancement. This study suggests that language can affect higher cognitive processes.

However, this research is not only relevant to MCI in the elderly. Swain & Lapkin's (2011) findings are important to a wide range of cognitive research. People experience events such as Swain and Lapkin described in everyday life. Most people have told a stressful story only to become angry about the events as though they had just transpired. As happened with Alise, the story can change as it is retold. At one point, a person may describe someone as having bumped into him or her. Later, that person may describe that person as having slammed into him or her. A tendency to remember, using language as a cognitive grounding mechanism, in such a way could relate to increased Neuroticism due to the increased profoundness of the emotions

experienced. It is possible, further, that the syntax of a language could specifically influence personality development.

Amongst all of the personality and language research, the primary investigator was not able to find a single piece of literature regarding the direct relationship between language and personality. This is shocking. Syntax structure is the set of rules that guides language; it is the very set of rules by which our thoughts and communication are organized. Moreover, this organization is involuntary. It is an automatic process existing below the realm of the conscious mind. Considering the example given above, in which bumping changes to slamming over time in memory recollection. The language used by an individual may influence the locus of control in the given situation; its syntactic structure may influence one to think about the world using an internal or an external locus of control. Different languages allocate different levels of importance to different syntactic constructs. In some languages, the actor may be more important. In others, the action may be more important. For instance, in English it is more popular to use active sentence structures. The popular way to say that someone dropped a book onto my foot is just that; it would sound more awkward, in English, to say "The book fell from his hand" as opposed to simply "He dropped the book." In Spanish, in order to express that an event that occurred was an accident, one can say *"Se le cayó"* (It fell from him.) This kind of expression is highly popular in Spanish. This language sets up a common syntactic practice in which the locus of control can be phrased to be external. Locus of control is a cognitive structure that can have robust influences on personality development. An internal locus of control could make someone more responsible and score higher in Conscientiousness, and it could make a person angrier at people and higher in Neuroticism. It could even make someone more appreciative of good deeds and thus higher in Agreeableness. Thus, the primary investigator

theorizes that the syntactic structure of a language is a regulator of personality development and could potentially drive changes in personality as an individual is exposed to new languages.

Due to the aforementioned research and theoretical grounding, the primary investigator hypothesized for the present study that certain FFM factors would be observed in certain languages over others. In order to increase reliability, two personality measures were used. The primary investigator also hypothesized that these measures would correlate positively with each other, with the exception of Neuroticism and Stability due to the fact that they are the inverse of each other.

H1: Each language group will demonstrate tendencies in personality that distinguish them from the others

H2: Neuroticism will be the inverse of Stability, while Extroversion = Extroversion, Openness = Intellect, Agreeableness = Agreeableness, and Conscientiousness = Conscientiousness

Method

Participants

The primary investigator contacted professors of French, German, Russian, and Spanish from the University of Alabama in Huntsville, the University of Alabama in Birmingham, the University of Alabama in Tuscaloosa, Stanford University, the University of West Alabama, Cornell University, the University of Indiana-Bloomington, and Middlebury College to distribute a flyer announcing and containing the link to his online survey to their students. As can be seen in Table 1 and Figure 1, from these educational institutions 25 students participated in this study. These participants include a mixture of compound and coordinate multilingual individuals. Over half of these students were studying Spanish (14 students, 7 of them male and 7 of them female).

A number of German (4 students, 2 of them male and 2 of them female) and Russian (4 students, 2 of them male and 2 of them female) participated, as well. The smallest group consisted of the French (3 students, 1 of them male and 2 of them female) students.

Due to technical malfunctions in the survey software, Qualtrics, some participants were blocked from proceeding in the survey after certain points. Due to this, two participants were unable to complete the survey. The primary investigator retained their data due to the fact that they completed the survey through the NEO PI 3 full length five factor personality test. An additional 8 participants were removed from the study (they are not included in the demographics above) due to this technical malfunction, as they only were able to complete the survey through the sample reading.

Due to reasons of confidentiality, the primary investigator is unaware of how many students were in each of the classes of the professors he contacted. However, the response rate of the professors agreeing to distribute the flyer advertising this study was 0.09%. In order to increase data collection, the primary investigator sought to collect data from as many universities from around the country as he could. He contacted professors multiple times, and near the end of his data collection he emphasized the urgency of his requests for their help. The only incentive available to students was extra credit at the discretion of the instructor, and this was only able to be given should there be an alternate means for students to attain the same extra credit apart from participating in this study in order to not overly induce students to participate. Most professors did not wish to give students extra credit for participation, and as such most students had no incentive to participate. Given the nature of survey-based studies, very little data was collected for this study. Given the resources for offering an incentive for this study and a longer period of time for data collection, this study might have yielded more robust results.

Design

The present study used a 4 X 5 (language X personality) design constituted by *post hoc* analysis. The languages investigated as independent variables were French, German, Russian, and Spanish. The dependent variables measured were scores on two separate personality inventories.

Materials

Data was collected through Qualtrics, an online survey software. A survey was created by the primary investigator using this software. The primary investigator created a consent form. He also included a set of affectively neutral sample readings in each of the target languages. This sample reading was on the history of Mesopotamia (Wikipedia, 2016). It was intended to prime language in participants and thus administer the manipulation separating them into four distinct groups. The main instruments used in this study were the NEO PI 3 full length five factor personality test (NEO). and the IPIP personality inventory (IPIP). The former measures personality on a 5 point Likert scale for five factors (Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness), and the latter measures personality on a 4 point Likert scale for five factors (Stability, Extraversion, Intellect, Agreeableness, and Conscientiousness). These measured the dependent variables. The primary investigator also created a biographical questionnaire for the purpose of eliminating confounds and assessing exposure to the target language. In this questionnaire, the primary investigator included a shortened Major Stressful Life Events Questionnaire (Common Cold Project, 2011) for the purpose of eliminating important life events as confounds, as these are known to affect personality. The primary investigator removed particularly stressful questions from this survey (e.g. "Have you had an

abortion in the past year?") in order to not impose unnecessarily distressing memories upon

participants. The debriefing included a final set of questions as a validity check and to ensure

that participants knew who they should contact should they have any questions.

Procedure

The study was administered via Qualtrics. Each section of the study was timed, and

Qualtrics was set to move participants on to the next section once the allotted time for each

section had passed. Participants were given more time than it was expected for them to take to

complete each part to help ensure that participants had plenty of time, accounting both for those

who tended to over-think questions and for extraneous variables that the primary investigator

was unable to control due to participation taking place outside of a well-controlled lab setting

such as distracting roommates or family members, slow internet, important phone calls, trips to

the bathroom, and anything else that the primary investigator was unable to keep participants

from doing outside of the survey. It was important that more time be allotted to participants than

it would have taken a decisive, on-task participant to complete each part of the study, as any data

received from participants that was incomplete would not be useable, and data would be

incomplete if participants did not complete a part for whatever reason before being moved on to

the next part of the study. Firstly, participants were be administered the consent form via

Qualtrics, and they gave consent by signing and giving their date of birth in the Qualtrics form,

acknowledging that they were eighteen years of age or older and that they consented to

participate in the study. Participants were then able to view an emotionally neutral sample

reading in their target language, which they were asked to read for ten minutes. Participants were

informed that they were to read as much of the sample reading as they could in the ten minutes

allotted. After these ten minutes, participants completed the NEO PI 3 full length five factor

personality test. Participants were given one hour to complete this personality inventory, and they were informed that they must complete their session on Qualtrics during this time and that they could not return to their computers to complete it later. After participants completed this personality inventory, they were given a ten minute break in order to diminish fatigue. After this time, Qualtrics automatically moved participants on to the next task. Participants completed the IPIP. Participants were also given one hour to complete this, and they were informed that they must complete it during this time and that they could not return and complete it later. Following this, participants completed biographical questionnaires; they were given thirty minutes to complete these under the same instructions. Following this, participants were debriefed via Qualtrics. They were asked a set of questions along with their debriefing, affirming that they understood the study, the nature of the incentives (that they are at their instructor's discretion), and who to contact should they have experienced any difficulties during the study. They were given ten minutes to complete these questions.

Statistics

Participants were scored based on their responses to the NEO PI 3 full length five factor personality test and the IPIP. Pearson correlations were calculated between scores on each of the two personality instruments to establish alternate forms of reliability, controlling for language as a confounding variable. Correlations were also compared across languages. Using this method, if scales differed in a subtle way that difference might be detected in one language and not another. For instance, if the NEO measured Openness as a permeability to ideas while the IPIP measured its supposed equal, Intellect, as intellectual curiosity, the two would not correlate perfectly and this would be evident. This was to determine whether these scales measure subtly different things and to determine to what extent the scores attained from them are reliable.

One-sample *t*-tests were used for the purpose of comparing the sample collected in this study to hypothesized normal distribution means. The expected mean for the NEO was *M* = 30, while the expected mean for the IPIP was *M* = 50. Raw scores were used for the NEO due to a survey malfunction scoring participants on a 4 point rather than a 5 point Likert scale, resulting in a lack for a basis to convert collected data from the NEO to standard scales.

Results

Significant results were obtained for the Pearson correlations computed, as can be seen in Table 2 and Figures 1-4. Amongst German (*R* = -.962, *α* = .038), Russian (*R* = -.993, *α* = .007) and Spanish   (*R* = -.784, *α* = .003) participants, Neuroticism and Stability scores were strongly negatively correlated. Also within German (*R* = .975, *α* = .025), Russian (*R* = .977, *α* = .023) and Spanish (*R* = .856, *α* = .000) participants, Extroversion scores between the two measures were highly positively correlated. Within the Spanish group, Openness and Intellect (*R* = .809, *α* = .001), Agreeableness (*R* = .795, *α* = .002), and Conscientiousness (*R* = .915, *α* = .000) were highly positively correlated. Spanish group scores correlated with strong positive values for all five factors, but there were no significant correlations among French participants.

Significant *t*-test scores were also obtained for the NEO measure. As can be seen in Table 3, French participants scored high on the NEO for Openness (*M* = 36.67, *SD* = 1.53, *SE* = .88, *t* (2) = 7.56, *p* = .02). As can be seen in Table 6, Spanish students scored high on the NEO for Extraversion (*M* = 34.36, *SD* = 6.15, *SE* = 1.64, *t* (13) = 2.65, *p* = .02), Openness (*M* = 34.93, *SD* = 3.83, *SE* = 1.02, *t* (13) = 4.81, *p* = .00), Agreeableness (*M* = 34.43, *SD* = 4.26, *SE* = 1.14, *t* (13) = 3.89, *p* = .00), and Conscientiousness (*M* = 38.86, *SD* = 6.98, *SE* = 1.87, *t* (13) = 4.75, *p* = .00). As can be seen in Table 4 and Table 5, no significant results were obtained for German or Russian participants taking the NEO.

Significant *t*-test scores were found for the IPIP measure, as well. As can be seen in Table 7, French participants scored high in Intellect ($M = 65.00$, $SD = 1.00$, $SE = .58$, $t(2) = 25.98$, $p = .00$). As can be seen in Table 8, German participants also scored high in Intellect ($M = 67.00$, $SD = 8.60$, $SE = 4.30$, $t(3) = 3.95$, $p = .03$). As can be seen in Table 10, Spanish participants scored high in Agreeableness ($M = 62.08$, $SD = 8.86$, $SE = 2.56$, $t(11) = 4.73$, $p = .00$), Conscientiousness ($M = 61.67$, $SD = 11.36$, $SE = 3.28$, $t(11) = 3.56$, $p = .01$), and Intellect ($M = 61.33$, $SD = 10.84$, $SE = 3.13$, $t(11) = 3.62$, $p = .00$). As can be seen in Table 9, no significant results were obtained for Russian participants taking the IPIP.

Discussion

Correlations

It is not surprising that French yielded no significant correlations (See Table 2). The sample size ($N = 3$) was the smallest of the four language groups. Based on the significant results found in other data and the rigorous testing of the validity of the scales used, it is likely that with a greater sample size more scores would have correlated between the scales. The other three language groups correlated with robust negativity ($R > .780$ for each group) for Neuroticism and Stability, confirming that portion of H2. This demonstrates that these scales reliably measure this factor of the FFM. The same can be said for the positive correlations between the two Extroversion scales ($R > .800$ for German, Russian, and Spanish). Openness/Intellect, Agreeableness, and Conscientiousness only correlated for Spanish ($R > .790$ for each of these), whereas these personality measures did not correlate significantly for any of the other three language groups. However, given the significant correlations attained and the fact that Spanish correlations were significant at the $\alpha < .01$ level for each group, it is likely that these findings are simply due to this study's low sample size.

_T_-tests

Between the scales used (see Tables 3 & 7) French students scored high on Openness/Intellect. The score for this factor being significantly high for both groups indicates a high level of reliability for these findings, especially with such a low N value ($N = 3$) and a roughly equal gender representation (See Table 1; M = 1; F = 2). Due to the low sample size, it is hard to determine whether or not additional significant factors would have emerged should N have increased. There were other factors that approached significance (low Neuroticism did between scales), so there is a statistical foundation for such an expectation. These findings for Openness reflect Ervin's (1964) expectations for TAT scores in French coordinate bilinguals based on the French cultural value for linguistic prowess. People who score high in Openness are more likely to have a wider vocabulary due to their love for variety and literature. Furthermore, France is a highly artistic culture. Some of the most famous paintings in the world are located in the Louvre. Being such an artistic culture, it is not surprising that French scores would be higher in Openness. This finding supports the idea that language could prime cultural trends in personality, thus supporting cultural accommodation theory and cultural frame switching.

German scores were high in Intellect on the IPIP scale only (See Table 8). Germany has produced many of history's most influential philosophers such as Nietzsche, Marx, Heidegger, Engels, and von Goethe. It even produced the great mind of Einstein. It is important to remember that Openness does not equate to IQ, but the commonality between these historic people is that they were all imaginative, insightful, original, curious, introspective, had unusual thought processes, valued intellectual matters, judged in unconventional terms, and lived in the world of ideas. These are all facets of Openness (McCrae & John, 1992). It is possible that Germany is a culture that promotes personality characteristics that lead to high Openness scores. Given that

Germany has produced such great minds that think in patterns characteristic to Openness, it is

not surprising that German students scored higher in Openness. Being as history and promoted

thought patterns are parts of culture, this finding supports the idea that language could prime

cultural trends in personality, thus supporting cultural accommodation theory and cultural frame

switching.

Spanish scores were high on Openness/Intellect, Agreeableness, and Conscientiousness

for both the NEO and the IPIP. Thus, these results can be interpreted to be especially reliable.

Spanish scores were also high on Extraversion for the NEO only. Spanish scores in this study

can be interpreted to be the most reliable out of all of the groups due to its having by far the

highest sample size ($N = 14$). A notable trend in Spanish scores is that they were high in the

particular factors of Openness, Agreeableness, and Extraversion. Latin-American personality

studies has suggested that there may be a personality trait unique to, and valued in, the Hispanic

world: *simpatía* Ramírez-Esparza et al. (2006). Someone who scores high in simpatía is tranquil,

tends to experience positive emotions, and is a generally kind and warm person. The world is

always good for a person high in simpatía. A person high in Openness finds beauty in

everything. In addition, someone high in Agreeableness is kind, appreciative, generous,

sympathetic, and warm. Finally, an individual who is high in Extraversion is warm, positive, and

friendly. There is a highly notable amount of overlap between these three factors of the FFM and

simpatía. As discussed in the introduction, the FFM factors can interact to yield other personality

characteristics (McCrae & John, 1992). It is possible that these three variables interact to produce

simpatía in Spanish-speaking people or those who are exposed to Hispanic culture. This study

provides evidence that supports the presence of the simpatía personality characteristic as being

related to Hispanic culture. It also provides support for cultural frame switching and cultural accommodation due to these findings.

Regarding the high Conscientiousness score among Spanish participants, it is useful to consider Spanish syntactic structure. In Spanish, the noun is not necessary to complete a sentence. For example, in order to say "She runs" one would say *"Corre"* ("(She) runs") instead of *"Ella corre"* ("She runs"). In Spanish, the noun is implied by the verb; it is only mentioned if it is necessary for clarification or emphasis upon the subject of the sentence. As such, the Spanish language's syntactic rules are structured in such a way that emphasis is put upon the verb or the action taking place in the sentence. Heavy emphasis being placed upon action in Spanish could generate cognitions in Spanish speakers that are more responsible, productive, organized, efficient, planning oriented, morally inclined, dutiful, achievement striving, and deliberate. These are all facets of Conscientiousness (McCrae & John, 1992), and they are all primarily concerned with an individual's actions. A counterargument to this is that heavy syntactic emphasis being placed on the noun, as it is in German, rather than the verb could likewise lead to high Conscientiousness scores due to the fact that it would lead to a concern with who is acting and with whom or with what. However, this argument is not as strong as the verb leading to high Conscientiousness argument because the only Conscientiousness-related facet that such questions lead to is criticalness. Verb-emphasis leads to many more Conscientiousness-related facets. Noun-emphasis leads to cognitions that are more supportive of Agreeableness, Extraversion, and Neuroticism, such as appreciativeness, sympathy, joy, anger, sociability, and dominance. Notably, these facets are all noun and object oriented, and noun-based cognitions lead to the inverses of these facets, as well. Verb-based cognitions lead to awareness of action, not a lack of it, which would lead to low Conscientiousness scores. Thus,

these findings also support the principal investigator's theory that syntactic structure is a key

component of language that influences personality development and change.

Russian participants were not observed with any significant scores on any of the factors

of the FFM (see Tables 5 & 9). Given the trends noted in other language groups, this is likely

due to its low N value ($N = 4$).

Limitations and Future Directions

This study had a number of limitations, and future research is highly recommended to

expand upon and verify the reliability of its findings. First, only one language prime was used. A

study in which members of each language group completed the survey in two languages would

provide stronger support for cultural accommodation and cultural frame switching, which are

contingent on personality characteristics differing when primed. Even stronger support for these

would be possible using a procedure in which the same participants completed the survey twice

at different times, once in each of two languages.

Furthermore, this study would be able to provide stronger evidence that personality

changed with exposure to target language if time exposed to target language were known and

correlations were calculated to compare beginning level participants to higher level participants

in each language on FFM factors.

Finally, the greatest limitation of this study was its dearth of participants. Three of four

groups (French, German, and Russian) were constituted by less than five participants. Thus, the

reliability of the findings for these groups is immediately questionable in spite of low α values

for the results obtained. Many changes could be made to a future study in order to avoid this

limitation. Firstly, technical difficulties in the survey software prevented participants from

moving forward in the survey. Many were blocked from continuing because Qualtrics would not

allow them to proceed at the end of timed blocks with no questions in them (the sample reading and the break). This decreased *N* by 8 participants. Secondly, this is a study that would be better spent using a longitudinal design over years retesting the same participants in order to most accurately measure the relationship between variables. Even using the same design, years would be preferable to months for good data collection. Lastly, most participants were given no incentive to participate as many instructors did not wish to allot extra credit to participate. Should resources have been available to provide an incentive, *N* would likely have been much higher.

Conclusion

In conclusion, this study provides evidence that supports cultural accommodation theory, the phenomenon of cultural frame switching, and the primary investigator's theory that syntax influences cognitive structures and consequently personality development and change through access to different cognitive frames. It showed that personality factors of the FFM distinguish groups of foreign language students between language, and it provided evidence of the inter-scale reliability of the NEO and IPIP. Future research is highly recommended to verify replicability and expand upon the results seen in this study.

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Table 1

Descriptive Statistics

Language	Frequency			Percent		
	M	F	T	M	F	T
French	1.0	2.0	3.0	33.6	66.7	12.0
German	2.0	2.0	4.0	50.0	50.0	16.0
Russian	2.0	2.0	4.0	50.0	50.0	16.0
Spanish	7.0	7.0	14.0	50.0	50.0	56.0
Total	12.0	13.0	25.0	48.0	52.0	100.0

Table 2

Pearson Correlations (R): NEO & IPIP

Language	N/S		E		O/I		A		C	
	R	ɑ	R	ɑ	R	ɑ	R	ɑ	R	ɑ
French	.993	.073	.937	.228	.327	.788	.961	.179	.115	.927
German	**-.962***	**.038**	**.975***	**.025**	.903	.097	.751	.249	.934	.066
Russian	**-.993***	**.007**	**.977***	**.023**	-.654	.346	.336	.664	.843	.157
Spanish	**-.784***	**.003**	**.856***	**.000**	**.809***	**.001**	**.795***	**.002**	**.915***	**.000**

**. Correlation is significant at the 0.01 level (2-tailed).

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

Table 3

NEO One Sample T-test: French

Factor	*n*	*M*	*SD*	*SE*	*t*	*df*	*p*	95% *CF* Lower	Upper
N	3.00	35.67	2.52	1.45	3.90	2.00	.06	-.58	11.92
E	3.00	31.67	9.02	5.21	.32	2.00	.78	-20.74	24.07
O	3.00	36.67	1.53	.88	7.56	2.00	**.02***	2.87	10.46
A	3.00	31.33	2.08	1.20	1.11	2.00	.38	-3.84	6.50
C	3.00	31.33	4.62	2.67	.50	2.00	.67	-10.14	12.81

**. Correlation is significant at the 0.01 level (2-tailed).

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

Table 4

NEO One Sample T-test: German

Factor	*n*	*M*	*SD*	*SE*	*t*	*df*	*p*	95% *CF* Lower	Upper
N	4.00	27.25	7.89	3.94	-.70	3.00	.54	-15.30	9.80
E	4.00	35.50	5.80	2.90	1.90	3.00	.15	-3.73	14.73
O	4.00	33.50	4.93	2.47	1.42	3.00	.25	-4.35	11.35
A	4.00	32.25	3.40	1.70	1.32	3.00	.29	-3.17	7.67
C	4.00	36.75	6.08	3.04	2.22	3.00	.11	-2.92	16.42

**. Correlation is significant at the 0.01 level (2-tailed).

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

Table 5

NEO One Sample T-test: Russian

Factor	*n*	*M*	*SD*	*SE*	*t*	*df*	*p*	95% *CF*	
								Lower	Upper
N	4.00	25.00	7.62	3.81	-1.31	3.00	.28	-17.12	7.12
E	4.00	32.75	7.04	3.52	.78	3.00	.49	-8.45	13.95
O	4.00	33.25	2.36	1.18	2.75	3.00	.07	-.51	7.01
A	4.00	32.25	5.44	2.72	.83	3.00	.47	-6.40	10.90
C	4.00	35.50	3.79	1.89	2.91	3.00	.06	-.52	11.52

**. Correlation is significant at the 0.01 level (2-tailed).

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

Table 6

NEO One Sample T-test: Spanish

Factor	*n*	*M*	*SD*	*SE*	*t*	*df*	*p*	95% *CF*	
								Lower	Upper
N	14.00	28.29	7.83	2.09	-.82	13.00	.43	-6.23	2.81
E	14.00	34.36	6.15	1.64	2.65	13.00	**.02***	.81	7.91
O	14.00	34.93	3.83	1.02	4.81	13.00	**.00****	2.72	7.14
A	14.00	34.43	4.26	1.14	3.89	13.00	**.00****	1.97	6.89
C	14.00	38.86	6.98	1.87	4.75	13.00	**.00****	4.83	12.89

**. Correlation is significant at the 0.01 level (2-tailed).

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

Table 7

IPIP One Sample T-test: French

Factor	n	M	SD	SE	t	df	p	95% CF	
								Lower	Upper
E	3.00	49.67	9.87	5.70	-.06	2.00	.96	-24.84	24.17
A	3.00	61.00	6.00	3.46	3.18	2.00	.09	-3.90	25.90
C	3.00	50.33	2.52	1.45	.23	2.00	.84	-5.92	6.58
S	3.00	47.00	2.00	1.15	-2.60	2.00	.12	-7.97	1.97
I	3.00	65.00	1.00	.58	25.98	2.00	**.00****	12.52	17.48

**. Correlation is significant at the 0.01 level (2-tailed).

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

Table 8

IPIP One Sample T-test: German

Factor	n	M	SD	SE	t	df	p	95% CF	
								Lower	Upper
E	4.00	56.25	10.81	5.41	1.16	3.00	.33	-10.96	23.36
A	4.00	64.75	14.91	7.45	1.98	3.00	.14	-8.97	38.47
C	4.00	59.25	6.95	3.47	2.66	3.00	.08	-1.80	20.30
S	4.00	50.75	7.85	3.92	.19	3.00	.86	-11.74	13.24
I	4.00	67.00	8.60	4.30	3.95	3.00	**.03***	3.31	30.69

**. Correlation is significant at the 0.01 level (2-tailed).

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

Table 9

IPIP One Sample T-test: Russian

Factor	n	M	SD	SE	t	df	p	95% CF	
								Lower	Upper
E	4.00	50.25	21.42	10.71	.02	3.00	.98	-33.84	34.34
A	4.00	60.00	9.31	4.65	2.15	3.00	.12	-4.81	24.81
C	4.00	56.50	7.42	3.71	1.75	3.00	.18	-5.30	18.30
S	4.00	56.75	9.00	4.50	1.50	3.00	.23	-7.56	21.06
I	4.00	66.25	10.63	5.31	3.06	3.00	.06	-.66	33.16

**. Correlation is significant at the 0.01 level (2-tailed).

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

Table 10

IPIP One Sample T-test: Spanish

Factor	n	M	SD	SE	t	df	p	95% CF	
								Lower	Upper
E	12.00	51.08	12.97	3.74	.29	11.00	.78	-7.16	9.33
A	12.00	62.08	8.86	2.56	4.73	11.00	**.00****	6.46	17.71
C	12.00	61.67	11.36	3.28	3.56	11.00	**.01****	4.45	18.19
S	12.00	54.17	13.64	3.94	1.06	11.00	.31	-4.50	12.84
I	12.00	61.33	10.84	3.13	3.62	11.00	**.00****	4.45	18.22

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).
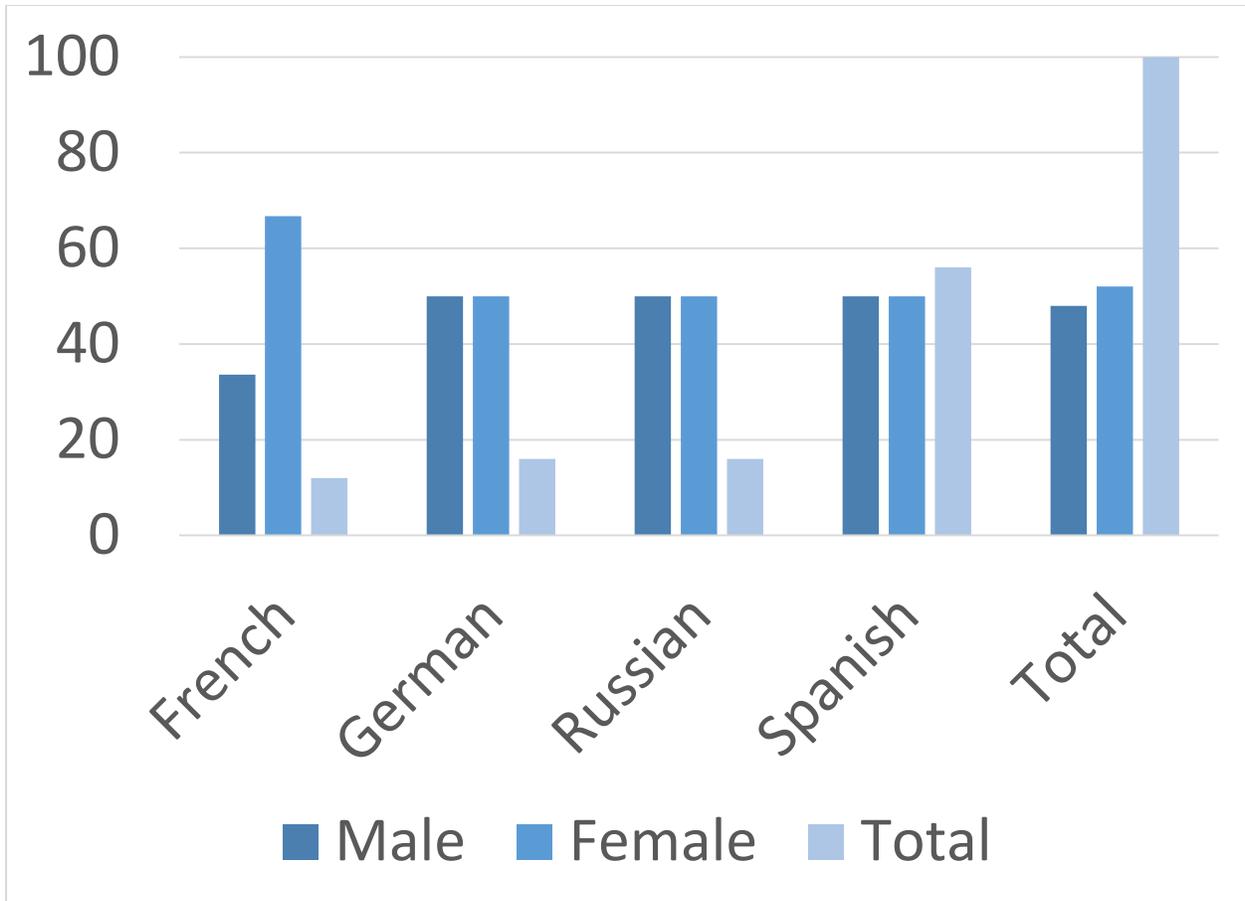
Figure 1. Male and female participation were equal in the German, Russian, and Spanish groups. However, in the French group there were more female participants.
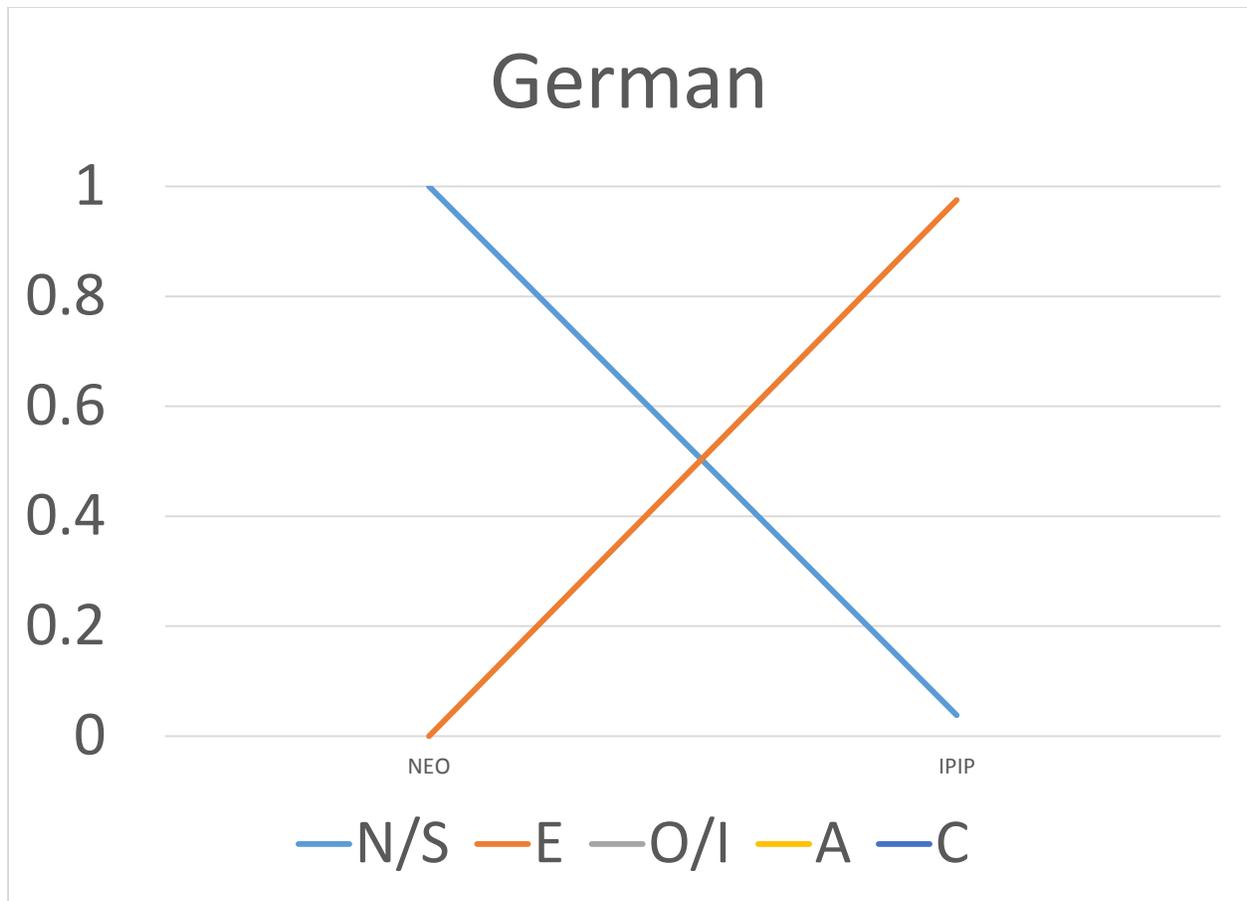
Figure 2. Extraversion correlated highly positively between measures in the German group, whereas Neuroticism and Stability correlated highly negatively.
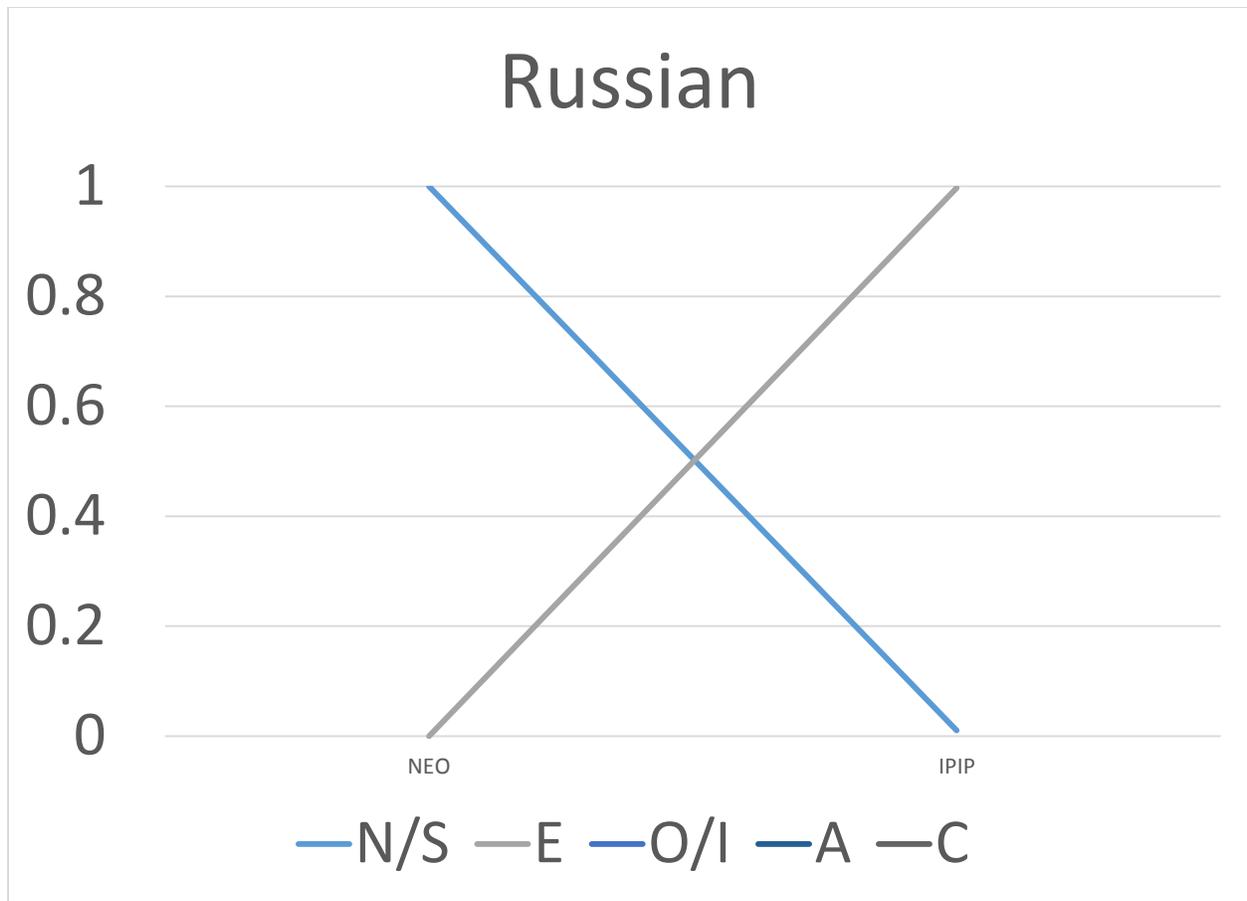
Figure 3. Extraversion correlated highly positively between measures in the Russian group, whereas Neuroticism and Stability correlated highly negatively.
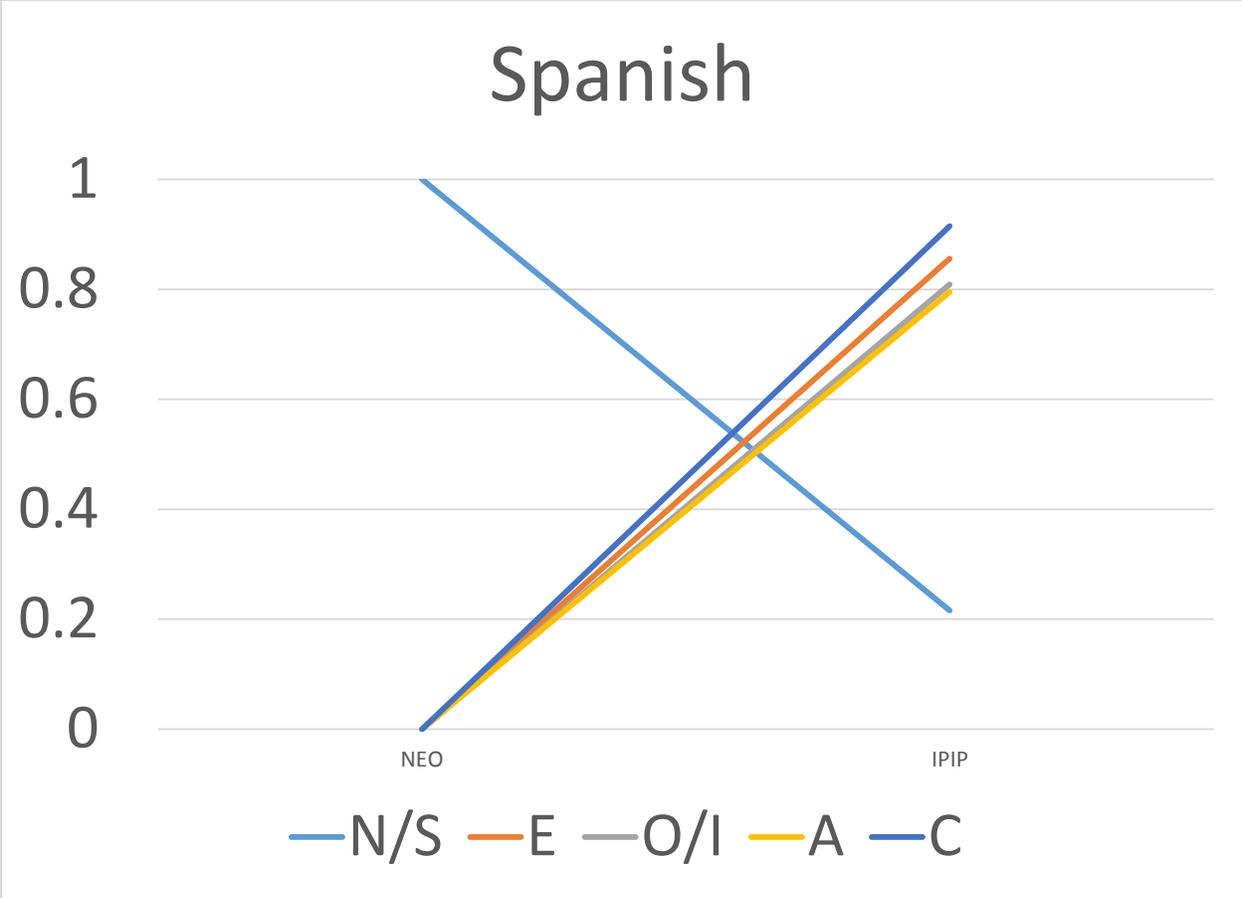
Figure 4. Extraversion, Openness/Intelligence, Agreeableness, and Conscientiousness all correlated highly positively between measures, whereas Neuroticism and Stability correlated highly negatively.