

FIVE-FACTOR MODEL AND NEO-PI-R IN TURKEY

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Abstract. Personality testing in Turkey has escalated in recent years even though the number of tests with solid psychometric properties is very low. Tests developed or adapted in recent years show a tendency to reveal a structure similar to that of Five-Factor Model. The Turkish version of the NEO-PI-R produced a factor structure that had five factors and that was congruent with the original factor structure. The scores from the adult sample showed some discrepancies from the original normative sample. Correlations with age and gender differences were similar to those obtained in other studies. The discrepancies between the Turkish adult sample and the American normative sample are possibly functions of cultural differences as well as the contextual factors that were influential on the response patterns of the Turkish sample. A second study with bilingual respondents displayed high correlations between the scores on the English and Turkish versions of the NEO-PI-R and there were significant differences between the two versions on four facet scores. These differences are interpreted in the framework of cultural contexts triggered by language.

Keywords: Language, context effects, factor structures, psychological assessment

1. INTRODUCTION

Personality theories have dual purposes. One purpose is to reach a general description of human personality characteristics that are relatively stable and that depict all human beings. The second purpose is to identify the sources of variation between people and to define dimensions of such variation. Today, many of the personality theories seem to focus on the sources of variation rather than invariant characteristics. If some particular tendency is basic and present in all humans at the same magnitude, then it does not account for any variation and therefore is less relevant to many of the current personality theories.

Studying variation and invariance in personality across cultures can be a tricky endeavor. First, in order to determine the invariant characteristics across cultures, researchers need to develop measurement devices that will produce the same category of responses irrespective of the language and the cultural context in which the device is presented. Second, in every culture, the measurement device must be composed of items that reflect the ordinary behavior of the respondents in. Third, the response patterns of the respondents must not be under the influence of any culturally directed tendency such as a tendency to agree or disagree, to respond in the extremes, to respond in a socially desirable manner (at least more so than other cultures), or to undervalue certain traits. Given these possible confounding circumstances, to achieve invariance across cultures is a highly remote possibility. Therefore, the consistency attained by the Five-Factor Model in different cultures, using various personality tests, cannot be regarded as coincidental. The aim of this chapter is to present the results of the recent standardization process of the NEO-PI-R in Turkey with the dual perspective of discovering invariant components and revealing the divergence.

2. PERSONALITY ASSESSMENT IN TURKEY

The history of personality testing is not very long in Turkey (Kağıtçıbaşı, 1994). Adequate test development or standardization began in early seventies leading to published tests within the same decade. Well-known examples of the seventies and the eighties are the MMPI (Savaşır, 1981), which is limited to clinical populations; Hacettepe Personality Inventory (Özgüven, 1992), a multi-purpose test that was developed using rather small sample sizes for reliability and validity studies; Eysenck Personality Questionnaire (Bayar, 1983); California Psychological Inventory (Demirtürk, 1987), composed of 18 subtests; and Symptom Distress Checklist (Kılıç, 1987), also a clinically-oriented checklist type test. Between early 1970s and mid-1990s, there have been several translations and adaptations generally characterized by small sample size and restricted populations, generally in theses and dissertations (Öner, 1994). Many of these tests on limited samples do not meet the

minimum standards for being considered adequate adaptations.

Recent years have rekindled the interest in personality testing partly due to the developments in personnel selection and career planning and the demand associated with these trends. Although companies reportedly use a large number of personality tests that were developed locally and a number that are translations of tests developed elsewhere, documentation for many of these tests is not available. Therefore, the discussion in this chapter will be limited to those tests for which there is documentation and sufficient research.

The Adjective Check List (ACL; Gough & Heilbrun, 1983) is one of the tests developed outside Turkey that has been adapted to Turkey (Savran, 1993). In its adaptation study, where the sample consisted of 350 males and 350 females, the Turkish version of the ACL showed the same factorial structure as the original version, with substantial reliability and validity. In a subsequent study with managers using the ACL (Sinangil, Savran, Öneş, & Balcı, 1997), the researchers found differences on the dimensions of order, military leadership, endurance, ideal self, and achievement, between first line, middle, and upper-level managers. They also observed correlations between age and order (.41), endurance (.39), military leadership (.31), change (-.25), and personal adjustment (.23). In another study, Savran and Balcı (1998) tested for differences in ACL factors in studies after studying counseling. They tested students in their freshmen and senior years and found that in their senior year, students scored higher in thirteen of the 24 dimensions, and they scored lower in four dimensions. Recently, the 28 scales of the ACL were subjected to a factor analysis and resulted in a five-factor solution approximating the factors of the Five-Factor Model (Savran, 2001).

In another adjective-based test, Tevrüz and Türk Smith (1996) developed a self-rating scale of 43 adjectives. They presented it to 236 undergraduate students and obtained a six-factor solution. In a second study (Türk Smith & Tevrüz, 1998), the authors revised the scale to contain 36 of the items in the previous version and presented these items to 120 undergraduate students. The participants of the study rated themselves, a disliked person, a liked person, the ideal person, and the typical person in their peer group. The final factor structure contained six factors that included Talent (*clever, brave, strong, perfect, superior, creative, talented*), Compliance (*humble, patient, calm, silent, easygoing, gentle*), Liveliness (*active, close, dynamic, cheerful, comical, talkative, joyful, loving, warm, teasing*), Restlessness (*conflicted, capricious, pessimist, aggressive, worried, nervous, impatient*), Determination (*determined, ambitious*), and Egoism (*selfish, egoistical*). Despite the limited number of items, small number of participants, and the fact that all the participants were undergraduate students, the factor structure resembled closely that of the Five-Factor Model. Two factors, Talent and Determination, represent Conscientiousness. Two other factors, Compliance and (low) Egoism, seem to match Agreeableness. The factors Liveliness and Restlessness have their exact matches in Extraversion and Neuroticism, respectively. One factor in the Five-Factor Model, Openness, has no counterpart in this particular study, but that is probably due to the limited range of adjectives in the initial item pool.

Somer (1998; Somer & Goldberg, 1999) has developed another test, based on adjectives descriptive of personality. After a thorough and meticulous selection of adjectives from the Turkish language lexicon, Somer and Goldberg (1999) developed a 235-item personality inventory. The development and validation of the test spanned three studies. The first study helped determine the adjectives, and in the second study the items were applied to 945 university students. In the third study (Somer, 1998), the inventory was given to 538 adults with an age range of 19-65. All three studies produced a factor structure similar to the five factors of McCrae and Costa (1997). Even though Somer and Goldberg (1999) expressed an expectation that the fifth factor would be closer to Intellect, the item clustering resembled the Openness factor. The order of emergence was consistent in both studies: Extraversion, Conscientiousness, Agreeableness, Neuroticism, and Openness.

Sümer, Sümer, Çifçi, and Demirutku (2000) developed a personality test specialized for personnel selection in the Turkish military. As a first step, they conducted a job analysis, and they had the personality characteristics resulting from the job analysis rated for relevance and importance. Factor analysis of these ratings revealed five factors: Conscientiousness, Military Factor, Self-Confidence, Agreeableness-Extraversion, and Leadership. As a next step, they developed a 242-item scale and applied them to 519 active officers. The analysis of these items revealed four factors similar to the previous factors except that Self-Confidence was subsumed under the Leadership factor.

In a separate study, Sümer et al. (2000) made modifications on the 242-item scale and applied the resulting 248-item version to 698 active officers. This final version of the test had 16 sub-factors that were organized under four major factors and three independent sub-factors. The first factor was the Military Factor and it included orderliness, commitment, military discipline and strength of character.

The second factor was Leadership, which included persuasion, group leading, tolerance to stress, determinedness, decision-making and problem solving. Conscientiousness was the third factor, subsuming work discipline, planning, and openness to development. The fourth factor was called Extraversion-Agreeableness and it included sociability, Agreeableness, and relationship with superior. Communication, monitoring task progress, and self-confidence sub-factors each loaded on a different factor. Some of the factors in this test seem to be agreeing with the trends in personality dimensions of various trait theories (e.g., Costa & McCrae, 1992; Goldberg, 1990). However, there seems to be more agreement between the sub-factors of Sümer et al. (2000) and Costa and McCrae (1992) for example, than the way these sub-factors are clustered around the main factors. Conscientiousness was a main factor in Sümer et al.'s research but one of the sub-factors, openness to development, was more relevant to the Openness factor, which did not emerge in their study. Sümer et al.'s Military Factor includes sub-factors that may be associated positively with Conscientiousness and negatively with Neuroticism and Agreeableness. Leadership factor includes sub-factors that were associated positively with Extraversion and Conscientiousness, and negatively with Neuroticism. Thus, the configuration of the sub-factors indicated that for a very specific population (predominantly male, young military officers), a different set of factors might be generated. However, one needs to bear in mind that the items were rated for relevance and kept if they met the condition of relevance for the task. The task-oriented test items may have shifted away from the purpose of measuring personality towards measuring acquired habits that are appropriate for the military tasks.

Sümer et al. (2000) have competently developed a tool to measure the necessary characteristics for military personnel. Their tool may not qualify completely as a personality test but it is appropriate for their purposes and their findings may provide some information specific to a particular segment of the Turkish population. The items were selected for relevance to military activity and therefore any item that deemed to be irrelevant as such was left out. The personality characteristics not included in the resulting structure may be those characteristics perceived to be irrelevant to functioning in the military environment. Their work may also exemplify the cultural differences within a group for which uniformity is incorrectly assumed. The evidence from Sümer et al. (2000) is not sufficient to warrant such a conclusion because item pool is purposive. However, the possibility that the structure of the test items for the military may not reflect the same structure for the overall Turkish population may suggest that there is possibly as much variation within the Turkish population as between Turkish and other populations.

The recent trend in personality testing in Turkey has been towards adjective-based tests with the exception of Sümer et al.'s (2000) test for a limited population. The NEO-PI-R has gone through the adaptation process concurrently with some of the other tests indicated in this section. The development of another test composed of items in the spirit of NEO-PI-R is currently underway by O. Somer (personal communication, January 16, 2001) based on Goldberg's International Personality Item Pool. With the presence of these two tests, substantial research with the five-factor perspective should be possible in the future.

3. THE TURKISH NEO-PI-R

For the Turkish version of the NEO-PI-R, the translation was performed by the author, who is Turkish, has studied English beginning in secondary school, and has studied and worked in the U.S. for nine years. The translation of the items was double-checked by a colleague who has studied, taught, and published in English in the area of clinical psychology. Once the translation was considered adequate, a faculty member in the History Department of Koç University who was not familiar with theories of personality, who was multilingual, and for whom both English and Turkish were foreign languages, back-translated it into English. The back translation was then sent to Robert McCrae, and upon his comments, modifications were made and the final back translations were sent for final approval. Most of the comments about the translation reflected problems with the back translation or wordings that were open to multiple interpretations. The final approved version was free of such problems.

One of the difficulties in translation is rooted in the structure of language. Turkish is a Ural-Altaic language that was influenced by Arabic and Persian during the Ottoman Empire and has undergone a purification process after the establishment of the Turkish Republic in 1923. The sentence structure is Subject-Object-Verb, although there is much flexibility in that ordering. The major difficulty in translating test items in English to Turkish is the lack of as many verbs with nuances in Turkish. The verb in Turkish for *like*, *enjoy*, or *love* is the same word: *sevmek*. According to Talmy's (1985)

typology, verb-framed languages like Turkish indicate path of action more than manner of action. The rarity of manner verbs necessitates an indirect description of the state by adjectives and adverbs in the translation so that the spirit of the item is preserved. The same is true for words that do not have a direct translation. It has always been a question whether the lack of a word in one language is indicative of the lack of that concept in that culture (Whorf, 1956). For example, if there is no single word in Turkish for the word *apprehensive*, does that mean speakers of Turkish never feel apprehensive, although they do feel anxious? The chapters in this volume present an answer to this question as well as the issue of how basic are our basic tendencies.

Another set of items that presented difficulty were those that were culturally American in content. For example, vacationing in Las Vegas, starting a self-improvement program, vacationing in an isolated cabin in the woods, and the new morality of permissiveness may be considered specific to a particular culture. Fortunately, NEO-PI-R contained few items in that category. In some of these items, alternative situations that preserved the spirit of the item were presented.

The translation process did not produce any other difficulties and there were minor modifications afterwards based on the wording recommendations by test takers or the research team.

There was an unforeseen predicament in the application of the scale to Turkish people, which may be related to the unfamiliarity of the five-point scales. In previous research with illiterate or semi-literate participants, we had observed participants having difficulty in fine-tuning between *disagree* and *strongly disagree* or *agree* and *strongly agree* responses. The participants responding to the NEO-PI-R were all literate and most were high school graduates or better. Still, some of them had problems in distinguishing between the two gradations of a response, especially when the item contained a qualifying adverb such as *rarely*, *seldom*, *often*, or *occasionally*. The participants in our sample frequently asked what the difference was between disagreeing and strongly disagreeing with a statement saying that you do something infrequently. With careful explanation by the research team, the respondents were able to respond using the whole scale. However, it remains an empirical issue to ascertain whether a three-point scale would produce the same outcome. Indeed, this may not be a language-specific problem but a logical problem present in many or all languages.

3.1. Psychometric and Normative Data for the Turkish NEO-PI-R

In the first study, the Turkish translation of the NEO-PI-R was given to participants for the purpose of observing its psychometric properties as well as obtaining normative data. The sample in this study included 804 participants, 301 undergraduate students and 503 working adults. Among the students, 137 were females, 123 were males and 41 did not indicate gender. They were representative samples from three consecutive entering groups at Koç University, Istanbul. The adult sample consisted of employees of a large company with various positions and levels of education. The company did not employ any selection procedure that included any testing except skill tests for positions requiring specific skills. Among the working adults 216 were females and 287 were males. For the 464 participants reporting age in this group, the age range was between 18 and 54 with the mean age of 29.2 ($SD = 5.6$). Together with the student sample, the mean age was 24.8 ($SD = 7.0$).

The test booklets and the answer sheets were designed to resemble the original version but they were printed in black on one side of the sheets.

The students were tested in groups of 10 to 24 people. They were invited to participate for 90 minutes so that they could respond without rushing. A member of the research team gave instructions verbally in addition to the written instructions. Most participants completed in approximately 45 minutes. The employees were verbally instructed on how to respond, with the specific instruction that they should complete the inventory alone whenever they could spare the necessary uninterrupted time. A member of the research team was available in person or by telephone at all times. The respondents were asked whether they had responded alone without interruption when they returned the tests. There were no reported problems in the administration of the tests.

3.1.1. Descriptive Statistics and Correlations

Table 1 shows the descriptive statistics for each of the domains and facets. The results for college students closely resemble the statistics for their American counterparts. The adults, however, show major differences in all five factors. Overall, Turkish adults show lower averages for Neuroticism and Agreeableness and higher averages for Extraversion, Openness, and Conscientiousness factors. For Neuroticism and Openness, the differences appear to stem from the female adult participants,

because there are only minor differences between Turkish and American adult males on these factors. Next, correlations between the facets were examined. There are several patterns in the correlation matrix that are worth mentioning. First, the intercorrelations among the facets of Agreeableness were generally low, especially the correlations of the other facets with A5: Modesty and A6: Tender-Mindedness. Other noticeably low correlations within domains were those between N4: Self-Consciousness and N5: Impulsiveness and between O1: Fantasy and O4: Actions. The intercorrelations among the facets of Conscientiousness were the highest. These facets also showed large negative correlations with N1: Depression and N6: Vulnerability. (The complete correlation matrix is available from the author.)

Table 1. Means and standard deviations for NEO-PI-R domains and facets.

Scale	Student				Adult							
	Female		Male		Total		Female		Male		Total	
	<i>M</i>	<i>SD</i>										
N	99.1	20.9	94.6	20.0	97.0	20.6	72.2	17.8	68.8	16.5	70.3	17.1
E	122.3	22.3	121.8	21.3	122.0	21.8	128.1	16.6	123.8	18.2	125.7	17.6
O	120.8	18.5	114.7	17.9	117.9	18.4	123.5	16.3	115.5	18.0	119.0	17.7
A	109.0	20.4	107.5	17.4	108.3	19.1	114.4	13.8	112.6	14.8	113.3	14.4
C	112.4	23.0	115.0	23.0	113.6	23.0	144.3	17.6	145.4	16.5	144.9	17.0
N1	16.6	5.3	15.6	4.6	16.1	5.0	11.3	4.3	10.7	4.1	11.0	4.2
N2	16.6	5.0	16.0	5.4	16.3	5.2	12.5	4.4	11.7	4.4	12.1	4.4
N3	16.2	5.3	15.1	5.2	15.7	5.3	10.2	4.3	10.2	4.2	10.2	4.2
N4	18.1	4.6	17.5	4.3	17.8	4.5	16.0	4.5	15.9	3.9	15.9	4.2
N5	17.8	4.7	17.7	4.0	17.7	4.4	13.8	4.0	13.2	3.6	13.5	3.8
N6	13.6	4.8	13.0	5.0	13.3	4.9	8.4	4.0	7.4	3.6	7.8	3.8
E1	22.3	4.2	21.7	4.4	22.0	4.3	21.6	3.8	20.6	4.2	21.0	4.0
E2	20.5	5.3	20.3	5.9	20.4	5.6	22.5	4.2	21.0	5.0	21.6	4.8
E3	15.9	5.3	16.8	4.5	16.4	4.9	19.0	4.4	19.4	4.4	19.2	4.4
E4	18.8	4.4	19.0	4.6	18.9	4.5	20.7	3.8	19.9	3.5	20.3	3.7
E5	22.1	4.7	21.1	4.5	21.6	4.7	20.4	4.3	20.7	4.3	20.5	4.3
E6	23.0	6.4	22.1	5.1	22.6	5.8	23.9	3.9	22.3	4.3	23.0	4.2
O1	19.8	4.2	20.1	4.2	19.9	4.2	17.6	5.0	17.9	4.8	17.8	4.9
O2	21.2	5.8	19.0	6.0	20.2	6.0	22.4	4.2	19.5	5.1	20.8	5.0
O3	22.5	4.2	22.2	3.8	22.4	4.0	21.8	3.7	20.0	4.2	20.8	4.1
O4	17.1	6.2	15.7	4.2	16.4	5.4	19.8	4.2	18.0	4.3	18.8	4.4
O5	18.6	5.6	17.0	6.4	17.8	6.0	19.7	4.6	18.6	5.3	19.1	5.0
O6	21.7	3.7	20.8	4.0	21.3	3.9	22.2	3.2	21.4	3.4	21.7	3.3
A1	17.1	4.6	17.4	4.9	17.2	4.7	18.2	4.3	17.8	4.6	18.0	4.4
A2	20.0	5.7	19.4	6.3	19.7	6.0	21.8	4.2	21.1	4.3	21.4	4.3
A3	23.5	4.4	23.5	3.9	23.5	4.2	25.9	3.4	25.2	3.4	25.5	3.4
A4	13.5	5.2	13.5	4.9	13.5	5.1	15.3	4.1	15.4	4.3	15.4	4.2
A5	15.9	5.4	14.5	5.2	15.3	5.3	15.3	4.0	15.4	4.3	15.3	4.2
A6	19.3	3.8	18.7	3.8	19.0	3.8	17.9	3.1	17.8	3.6	17.8	3.4
C1	20.9	3.9	21.0	4.0	21.0	4.0	24.6	3.0	24.6	3.2	24.6	3.1
C2	16.0	6.9	17.0	6.9	16.5	6.9	22.0	5.3	22.5	4.8	22.2	5.1
C3	21.4	4.4	21.0	4.8	21.2	4.6	26.7	3.1	26.6	3.1	26.7	3.1
C4	19.4	5.1	20.2	5.0	19.8	5.1	25.3	3.9	25.5	4.0	25.4	3.9
C5	17.5	5.3	18.3	5.2	17.9	5.3	25.2	3.6	25.1	3.2	25.2	3.3
C6	17.1	4.8	17.3	4.7	17.2	4.7	20.5	4.0	21.1	4.0	20.9	4.0

Note. N = Neuroticism, E = Extraversion, O = Openness to Experience, A = Agreeableness, C = Conscientiousness. See Table 2 for facet scale labels.

3.1.2. Factor Structure

A principal components factor analysis was conducted in the full sample ($N = 804$). The scree plot and the eigenvalues both clearly suggested five factors. Table 2 displays the factor structure obtained after a Varimax rotation, the variance accounted for each factor, and the congruence coefficients with the American normative structure for the five factors. The resulting factor structure supports the five factors intended in the original NEO-PI-R. Except for one facet, N5: Impulsiveness, which loads somewhat more highly on Conscientiousness than it does on Neuroticism, the largest loading of all the facets are on the same factors as in the original structure. Procrustes rotation produced variable congruence coefficients between 0.88 and 1.00 for the facets, with only three facets having coefficients less than 0.95.

This is indicative of a successful adaptation process for the NEO-PI-R as well as support for the cross-cultural validity of the Five-Factor Model. The order of emergence in the analysis is worth noting as well: Conscientiousness, Extraversion, Neuroticism, Openness, and Agreeableness. Other research with Turkish samples such as Somer (1998), Somer and Goldberg (1999), Türk Smith and Tevrüz (1998) all culminate in the same structure. The five-factor structure is supported not only by adaptations of tests (e.g., the Adjective Check List by Savran, 1993), but also by tests developed from a pool of personality-descriptive adjectives in Turkish (Somer, 1998; Somer & Goldberg, 1999) and one developed from a limited number of selected adjectives (Türk Smith & Tevrüz, 1998).

Table 2. Factor structure of the Turkish NEO-PI-R, congruence with the original factor structure, and internal consistency coefficients for the facets.

NEO-PI-R Facet	Varimax-Rotated Component					Alpha
	N	E	O	A	C	
N1: Anxiety	.74	-.10	.00	-.10	-.38	.75
N2: Angry Hostility	.62	.09	-.07	-.43	-.26	.70
N3: Depression	.67	-.25	-.04	.00	-.46	.77
N4: Self-Consciousness	.69	-.23	-.12	.11	-.02	.44
N5: Impulsiveness	.42	.27	.13	-.17	-.53	.59
N6: Vulnerability	.62	-.09	-.04	.00	-.58	.78
E1: Warmth	-.01	.71	.16	.33	-.07	.66
E2: Gregariousness	-.27	.70	-.02	.08	.12	.75
E3: Assertiveness	-.41	.49	.13	-.28	.38	.73
E4: Activity	-.03	.62	.15	-.22	.27	.56
E5: Excitement-Seeking	-.03	.68	.13	-.20	-.10	.62
E6: Positive Emotions	-.14	.71	.25	.08	.09	.67
O1: Fantasy	.05	.23	.51	-.10	-.36	.68
O2: Aesthetics	.13	.13	.75	.11	.16	.74
O3: Feelings	.22	.39	.62	-.03	-.07	.66
O4: Actions	-.32	.15	.51	-.18	.15	.63
O5: Ideas	-.19	-.04	.74	-.02	.13	.77
O6: Values	-.34	.08	.48	.04	-.09	.45
A1: Trust	-.19	.27	.09	.63	-.01	.72
A2: Straightforwardness	-.01	-.18	-.02	.61	.26	.66
A3: Altruism	-.02	.31	.03	.60	.41	.72
A4: Compliance	-.19	-.26	-.06	.68	.13	.64
A5: Modesty	.14	-.34	-.14	.51	-.05	.72
A6: Tender-Mindedness	.25	.30	.00	.55	-.15	.44
C1: Competence	-.25	.29	.14	-.03	.73	.69
C2: Order	-.05	-.02	.01	.08	.78	.84
C3: Dutifulness	-.06	.03	.01	.27	.82	.72
C4: Achievement Striving	-.12	.29	.09	-.15	.76	.81
C5: Self-Discipline	-.30	.12	.02	.04	.83	.83
C6: Deliberation	-.17	-.21	-.03	.15	.74	.73
Percent of Variance	11.2	12.5	8.4	9.5	18.0	
Congruence coefficient	.96	.96	.97	.98	.96	

Note. $N = 804$. Factors have been reordered.

In the Varimax factor structure of the Turkish NEO-PI-R, the factor with the highest portion of the variance was Conscientiousness. In addition to the expected facets of Conscientiousness, four more facets had high loadings ($> .4$) on this factor. A3: Altruism loaded in the same direction with the Conscientiousness facets and N3: Depression, N5: Impulsiveness and N6: Vulnerability loaded negatively.

The loading of Altruism with other Conscientiousness facets may be hardly surprising for those familiar with the Turkish culture, where helping others is considered a civic responsibility as well as being part of the customs. It is equally likely that conceptualization of altruism may vary according to the culture and the level of relatedness among the individuals in that culture (Kağıtçıbaşı, 1996a). Altruism is a natural necessity when there is a high level of connectedness among the members of a culture. In cultures where self is construed in relationship to the community, helping behavior is the norm rather than the exception. Many visitors to countries like Turkey are surprised (and sometimes annoyed) by the extent of assistance they receive from total strangers, let alone individuals they have met. Farmers often rely on solidarity among members of the community for seasonal help. Similarly, preparation for a wedding in traditional communities is an activity in which all the members of the community give a hand to the parents of the bride and the groom.

Impulsiveness is naturally contradictory with Conscientiousness because an impulsive person would lack self-discipline and deliberation. Similar loadings for Impulsiveness and Vulnerability were present in findings reported by McCrae (2000), McCrae and Costa (1997a), and Piedmont and Chae (1997). Finally, Depression items may be considered somewhat contradictory with those of Competence, Achievement-Striving and Self-Discipline, which are the facets of Conscientiousness.

The Extraversion domain was the second largest factor, defined only by the expected facets. The third factor, Neuroticism, contained a high negative loading of Assertiveness in addition to all the Neuroticism facets. This indicates that lack of assertiveness can be considered a sign of neurotic behavior, although intuitively in the Turkish culture, one would expect extreme assertiveness to be considered neurotic. McCrae and Costa (1997a) have also reported similar negative correlations between Assertiveness and Neuroticism in several cultures, supporting a link between assertiveness and dominance and the perception of dominance as a trait of emotionally stable individuals. Heuchert, Parker, Stumpf, and Myburgh (2000) and Mastor, Jin, and Cooper (2000) have also observed that Assertiveness loaded on Neuroticism in South Africans and Malays. Agreeableness was the fourth factor with all the expected facets loading on it. Agreeableness also included Angry Hostility as a secondary loading, in the reverse direction. This outcome resembles that obtained by Costa and McCrae (1992) in the factor structure of the original inventory as well as those by Heuchert et al. (2000), Mastor et al., (2000), McCrae and Costa (1997a), and McCrae (2000). Finally, Openness emerged as a clear factor with the expected facets loading on it without any secondary loadings.

3.2. Effects of Age, Gender, and Other Sample Characteristics

The sample included both college students and adults, but a portion of the adult sample was as young as the college sample. Age was studied as a variable only within the adult sample, because contextual factors had the potential to confound the outcome if the two samples were combined. The correlation between age and scores using only the adult group ($N = 460$) revealed a general lack of significant correlations, and those that were significant were very low. Three factors, Extraversion ($r = -.12, p < .01$), Openness ($r = -.16, p < .001$), and Agreeableness ($r = .13, p < .01$) showed significant correlations with age, whereas there were no correlations between age and Neuroticism or Conscientiousness. The correlations between age and individual facet scores reflected the overall tendency observed in the correlations with the factors. None of the Neuroticism and Conscientiousness facets correlated with age. In Extraversion, three of the facet scores correlated significantly with age: Activity ($r = -.12, p < .01$), Excitement-Seeking ($r = -.15, p < .01$) and Positive Emotions ($r = -.14, p < .01$). In the Openness factor, Fantasy ($r = -.15, p < .01$), Aesthetics ($r = -.13, p < .01$), Feelings ($r = -.19, p < .001$), and Actions ($r = -.13, p < .01$) correlated significantly with age. Finally, among the facets of the Agreeableness factor, Trust ($r = .12, p < .01$) and Compliance ($r = .17, p < .001$) correlated significantly with age.

In order to determine group differences (student vs. adult) that were not accounted for by age, a MANCOVA was conducted where the group was used as an independent variable and age was used as a covariate. Age was a significant covariate on Extraversion ($F(1, 731) = 5.55, p < .05$), Openness ($F(1, 731) = 10.91, p < .005$), and Agreeableness ($F(1, 731) = 4.90, p < .05$). However, group

differences between adults and students were sustained as shown in subsequent univariate analyses. Students were higher in Neuroticism ($F(1, 731) = 124.82, p < .001$), whereas adults were higher on Extraversion ($F(1, 731) = 7.37, p < .01$), Openness ($F(1, 731) = 6.68, p < .05$), and Conscientiousness ($F(1, 731) = 178.40, p < .001$).

The correlations and age effects reported here agreed with those reported by McCrae et al.'s (2000) findings in German, British, Czech, Spanish, and Turkish samples using the NEO-FFI. They have also found decrease in Neuroticism, Extraversion, and Openness and increase in Conscientiousness and Agreeableness with age. Consistent age differences across cultures may point to a natural maturational progression that is biologically determined. On the other hand, cohort effects cannot be ruled out easily because even though these cohorts across cultures do not share identical historical forces, there is increasing homogenization of experiences across cultures. (A discussion of homogenization will take place later in this chapter as a possibility to investigate.) Twenge (2001) has performed a meta-analysis on the data from the Extraversion scores from the Eysenck Personality Inventory and Eysenck Personality Questionnaire given to college students between 1966 and 1993. The analysis indicated a clear cohort effect with a large effect size. This result may help resolve the seemingly contradictory findings of age differences in Extraversion (or any other trait) and long-term stability of such traits.

Besides the age differences, gender differences were investigated, together with the group differences because major group differences were found in the previous analyses. The two-way MANOVA on five factors investigated whether there were gender differences along the same lines as in other research and whether these gender differences were consistent across the two groups of participants. There were no interactions between gender and group indicating gender differences to be consistent across student and adult samples (all $F_s < 1$).

Univariate analyses indicated gender main effects on Neuroticism ($F(1, 729) = 7.47, p < .01$) and Openness ($F(1, 729) = 26.59, p < .001$). Females scored higher ($M = 82.58, SD = 23.09$) in Neuroticism than males ($M = 76.53, SD = 21.19$) and they also scored higher ($M = 122.47, SD = 17.23$) in Openness than males ($M = 115.27, SD = 17.92$). The higher scores of females on Neuroticism is consistent with other research (e.g., Costa & McCrae, 1992; Tevrüz & Türk Smith, 1996; Lynn & Martin, 1997). In a study that included participants from 26 cultures, Costa, Terracciano, and McCrae (2001) also reported higher scores by females in all facets of Neuroticism and three facets of Openness: Aesthetics, Feelings, and Actions.

Age, group, and gender differences resemble the overall patterns obtained in other studies. Age patterns were virtually identical to those obtained by McCrae et al. (2000) with British, Czech, German, Spanish, and Turkish participants.

The group differences that were observed in addition to age effects point to the fact that the adult sample and the student sample reflected differences beyond those explained by age. The group differences between student and adult samples are in agreement with the Costa and McCrae (1994) for the domains of Neuroticism, Agreeableness, and Conscientiousness. In the current study with Turkish adults and students, adults were higher in the domains of Extraversion and Openness, which was a reversal of the pattern in Costa and McCrae (1994). Whether these dissimilarities can be immediately attributed to cultural differences is a difficult question. The transition from being a student to adulthood is not only a change in age. The analyses above showed differences were not attributable to age. Thus, this transition in social standing may result in certain changes in adaptations. When one is in college one does not need Extraversion, because enthusiastic peers are easily available, and the university environment is less competitive and friendlier. However, the workplace is quite different. Competition is increasingly a part of reality, and people are not drawn automatically to each other as they are in campus settings. Therefore, in adult life, Extraversion is a more requisite characteristic. It may be argued that people who have the basic tendency of Extraversion begin to activate or display this tendency when they move to an adult life. Similarly, the college environment is characterized by relative homogeneity. In contrast, the work environment brings together a more varied sample of people. Consequently, Openness may emerge in the context of interaction with different types of people.

It is also possible that the differences between adults and students in Extraversion and Openness was a function of their respective cohorts as indicated in Twenge's (2001) research on Extraversion, although the trend in her research is in the opposite direction from the current findings. İmamoğlu and Aygün (1999) have provided some results that corroborate the possibility of a cohort effect. They have shown, for example, that Turkish university students in the 1970s valued intellectual characteristics, independence, and imaginativeness more than students in the 1990s. Finally, the fact

that the adults and the students responded to the items in very distinct settings and contexts may have led to different types of pressures and response biases. Specifically, the adults may have exaggerated qualities they thought would make a favorable impression at work.

The gender differences in the current study showed females to be higher than males in Neuroticism and Openness. The outcome regarding Openness seems in agreement with the findings reported in Costa et al. (2001). Higher Openness in females is also supported by cultural elements. In the characterization of the Turkish culture, males are depicted as more conservative and more resistant to change (İmamoğlu & Yasak-Gültekin, 1993). Males are also expected to preserve and protect the value system of the society (İmamoğlu & Aygün, 1999). Then, the argument here is that the source of the difference may be the lower Openness level of the males as a consequence of cultural demands.

3.3. Comparison with the American Normative Sample

In order to describe the general profile of a culture, a comparison is necessary; therefore we can describe the Turkish adult profile as plotted on the American adult profile forms. A word of caution is necessary here. As I shall discuss below, the adult sample may be somewhat affected by contextual factors present when responding to the NEO-PI-R, and their scores may not be representative of all contexts.

Both Turkish males and females scored average on the Neuroticism factor (*T*-scores of 47 and 45, respectively). Both groups scored at about equal levels and high on Extraversion (*T*-scores of 60 for females and 58 for males). On Openness, females scored high and males were in the higher range of average (*T*-scores around 58 and 47, respectively). Turkish males were in the lower part of the average range on Agreeableness with a *T*-score of 46. Females scored low on Agreeableness with an average score approaching the very low range (*T*-score of 40). On Conscientiousness, both Turkish males and females scored on the upper range of high Conscientiousness (*T*-scores for both groups around 62).

When the facet scores were examined, some scores that were in the low or high ranges were observed. Turkish females were particularly lower than American females on Anxiety, Trust, Compliance, Modesty, and Tender-Mindedness. They were also higher than their American counterparts on Gregariousness, Assertiveness, Excitement-Seeking, Aesthetics, Actions and all of the Conscientiousness facets, particularly, Achievement Striving. Turkish males displayed similar tendencies such that they also scored high on Gregariousness, and all the facets of Conscientiousness. Similarly, they scored low on Trust, Compliance, and Modesty.

Explaining the differences. These differences were surprising in most cases for those who are familiar with both Americans and Turks. For example, Turkish females scored very low on Agreeableness when compared with their American counterparts. Although their raw scores would be considered average when compared with the American males or the Turkish males, they remain considerably below the American sample. Several explanations could be offered. First, the sample consisted of professional women who may have been selected for certain characteristics that would make them successful in the workplace. Second, they may have adopted more masculine characteristics to exist in a man's world. A third explanation could be that the social pressures present in the workplace may have selected those characteristics as the adaptive ones over time. Early demographic research (Blitz, 1975) has shown that as early as the 1960s, 38.2% of the labor force in Turkey was female as opposed to 32.7% in the U.S. Moreover, the proportion of females in high-prestige professional jobs was 25%, whereas in the US it was 2.3%. These figures are functions of the encouragement of females to participate in the workforce with the establishment of the republic, which may have turned into some sort of social pressure for professional identity. Turkish women may have developed more masculine tendencies in interpersonal relations, being less submissive and less Agreeable and more dominant and more extraverted (Costa, Terracciano, & McCrae, 2001).

In addition, conceptualization of the facets may be an important factor in comprehension of discrepancies between judgments about a culture and descriptive scores obtained in a study. Trust is a good example. Trust is inherent in the American system where declared information is assumed to be correct. In Turkey, on the other hand, in many official transactions one needs to obtain documentation for even insignificant information like home address through government offices. In contrast, one can go to a neighborhood bazaar and buy a rug, paying in installments. The merchant, who is there only one day a week, asks for a name and address and arranges for dates of payments assuming that the information provided is correct and that the buyer will return periodically to make

the payments. Moreover, this situation takes place not in a small village but in a large, cosmopolitan city like Istanbul with a population of over 10 million.

More examples of trust and mistrust can be provided from either country. The cultural differences lie in the context and the type of trust. As McCrae and Costa (1999) argue, the culture may determine the context and type of a particular individual tendency. When items of a personality test are developed in one cultural frame, the items may be a representative sample of contexts and types for that specific culture. The adaptation, however, just like the present one, may translate the original set of items and if they are valid for some contexts in the adaptation sample, the items will work. The missing component will be that the items may not constitute a representative sampling of contexts for the adaptation group. In addition, members of some cultures may possess a higher need to think about their responses in a context. Our research team reported that a good number of our respondents felt uncomfortable in responding to some items because they wanted to respond as "it depends," contextualizing their responses. Kağıtçıbaşı (1996b) comments that there are cultural differences in the conceptualization of people such that when Americans describe people, they tend to use more trait descriptions whereas Indians describe a changeable person whose behavior is dependent upon situational context. Then, if that is true, one should expect considerable difficulty in using personality tests, especially the adjective-based tests, in cultures like India. On the other hand, there seems to be a set of studies with consistent findings of five-factor structure even in countries where contextualization is expected such as Turkey and India (Lodhi, Deo, & Belhekar, this volume).

Furthermore, it is possible that many of our respondents responded to the items having in mind the job context (or the school context for the student respondents) because that was where they were taking the inventory. For example, both male and female adult respondents had high average Conscientiousness scores. Thus, the level of the trait represented here may be representative of their behavior only in the job context. Findings supporting the presence of such influences have been reported by Schmit, Ryan, Stierwalt and Powell (1995). Therefore, it would be misleading at this point to assume that the scores in this report represent the profiles of Turkish adults in general. The observations regarding contextual factors introduce questions of the extent and type of context effects present in all types of research. Because all data collection takes place in some context, estimating the magnitude of context influence, if any, becomes a major issue. The context may influence responses to test questions by defining a set of desirable characteristics. The respondents may be inadvertently responding in a way they consider more desirable in that context, or they may feel the pressure of being assessed by people in positions of authority such as managers or professors, even if they have been specifically informed that this would not be the case.

4. A BILINGUAL STUDY

In order to provide information on the equivalence of the Turkish version of the NEO-PI-R to the English version, a group of bilingual participants were given both versions with a two-week interval between the two administrations. Although bilingual studies provide valuable information, the outcome of such research is not definitive because multiple explanations are possible for any differences between the results of the two versions.

One reason the test results may be different is the obvious reason that the two versions are not equivalent. The translation process may have shifted the test items in various directions. The second possible reason is that the bilingual participants of the research are not equally fluent in both languages, and consequently, their responses may be affected by the incorrect interpretation of the items in their less fluent language. A third reason is the possibility that the language of the test creates a cultural frame and the participants respond within the expectations created by that culture. If the cultural frames are sufficiently distinct then the response patterns will be different. The different response patterns would be expected to vary in one direction for all participants in this case. Finally, the languages may create individual cultural contexts in which the individuals have different selves. This is distinct from the cultural frame in that the emphasis is on the individual's representation of self in a particular language rather than the general cultural frame. Gradually, evidence from research has accumulated indicating that there are differences in the representation of self in different languages (see Schrauf, 2000, for a review). It is plausible that in responding to the test items the participants are retrieving information about self from different culture-specific and language-specific pools.

The absence of any differences between the results in the two languages would support both the identity of the two versions and stability of personality characteristics regardless of cultural contexts. In that case, self is a singular unit not affected by the cultural context.

The participants were 15 faculty or staff between the ages of 23 and 53 at Koç University, where the medium of instruction is English and many faculty members are Americans. The call for participation stated the necessity of being equally comfortable in both languages. Participation was voluntary and confidentiality was ensured. All the participants reported Turkish to be their native languages except one, who reported both languages as native tongues.

The participants were given two envelopes each containing either the English version or the Turkish version of the NEO-PI-R. The envelopes indicated that one was to be completed immediately and the other two weeks later. The order of taking the tests was counterbalanced across participants. These envelopes were given in a larger envelope that also contained a questionnaire about language behaviors in each language. The participants were asked to seal each envelope after completing the test in it and to return both envelopes and the questionnaire to the author's mailbox in the larger envelope.

Table 3. Mean domain and facet scores of bilingual participants in Turkish and English versions and the correlations between the two versions.

NEO-PI-R Scale	Turkish		English		<i>d</i>	<i>r</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Neuroticism	86.1	27.1	86.4	29.8	-.01	.95**
Extraversion	116.1	27.4	117.1	25.9	-.04	.98**
Openness	131.2	14.1	130.3	17.2	.06	.87**
Agreeableness	116.2	12.7	112.2	13.6	.30	.81**
Conscientiousness	125.6	24.9	126.3	25.3	-.03	.93**
Anxiety	15.7	6.9	16.1	6.5	-.06	.94**
Angry Hostility	14.3	5.2	13.5	6.6	.14	.88**
Depression	13.5	6.4	13.5	6.3	.00	.91**
Self-Consciousness	16.1	4.4	14.9	5.2	.25	.74**
Impulsiveness	16.5	5.7	16.7	4.1	-.04	.70**
Vulnerability ^a	9.8	6.3	11.7	6.6	-.29	.91**
Warmth	20.7	4.4	21.1	4.9	-.09	.91**
Gregariousness	17.8	7.2	18.7	6.7	-.13	.94**
Assertiveness	16.5	5.5	17.3	7.2	-.13	.94**
Activity	20.1	4.2	20.3	3.5	-.05	.80**
Excitement-Seeking	18.7	6.3	18.0	4.2	.14	.89**
Positive Emotions	21.7	5.4	22.4	4.7	-.14	.91**
Fantasy ^b	21.3	3.9	18.7	5.0	.59	.77**
Aesthetics	22.1	4.5	23.0	4.6	-.20	.75**
Feelings	24.3	3.3	23.8	4.3	.13	.69**
Actions	17.8	3.9	17.3	4.3	.12	.72**
Ideas	21.6	4.3	22.7	3.5	-.29	.72**
Values	24.0	3.2	24.9	3.0	-.29	.78**
Trust	19.3	4.7	19.7	5.3	-.08	.79**
Straightforwardness ^b	23.1	5.9	20.0	4.8	.59	.91**
Altruism ^b	23.1	3.6	21.2	3.8	.51	.87**
Compliance	15.6	4.5	15.9	4.2	-.07	.69**
Modesty	15.9	4.2	15.2	4.3	.16	.76**
Tender-Mindedness	19.2	3.0	20.2	2.4	-.38	.48
Competence	22.3	3.9	23.2	4.4	-.22	.77**
Order	17.7	5.8	17.9	5.9	-.03	.88**
Dutifulness	24.8	4.1	24.7	3.3	.03	.78**
Achievement Striving	22.6	4.3	21.5	4.1	.26	.74**
Self-Discipline	21.5	6.4	21.7	5.8	-.03	.90**
Deliberation	16.8	5.1	17.3	5.8	-.09	.95**

Note. *N* = 15.

^aThe difference between the Turkish and English versions is significant, $p < .05$.

^bThe difference between the Turkish and English versions is significant, $p < .01$.

** $p < .01$

The first analysis performed on the data obtained from bilingual participants was the correlation between the scores in each language. Table 3 shows that the correlations between the scores of the Turkish and English versions are in general significant and very high, except for one of the facets (A6: Tender-mindedness). The facets of Extraversion seem to have highest correlations and the facets of Openness the lowest.

The next set of analyses involved comparing the scores on the English version with those on the Turkish version. Before the analyses, any effect of receiving the test in one language first was tested and no such effect was found on any of the factors. The within-subjects *t*-test revealed that the English and Turkish versions of the tests led to similar outcomes. The means and standard deviations for each version are also presented in Table 3. The only significant differences were observed in N6: Vulnerability, O1: Fantasy, A2: Straightforwardness, and A3: Altruism. For Vulnerability, participants had higher scores when they took the NEO-PI-R in English. In Straightforwardness, Altruism, and Fantasy, the scores were higher for the Turkish version. When individual differences were examined, it was observed that 10 to 12 of the participants had differences in the direction shown by the overall group.

The results obtained with a limited sample lean towards the similarity of the two versions of the tests, although in four of the 30 facets, there were significant differences. It is possible to attempt an interpretation of the differences solely in the context of the differences obtained here, but more convincing arguments may be developed if the results from Study 1 and Study 2 are combined.

4. CULTURE, LANGUAGE, AND FIVE-FACTOR MODEL OF PERSONALITY

In the previous sections, the standardization process of the Turkish version of the NEO-PI-R and a study on a limited and select group of bilinguals were described. The results indicated that the five factors emerged in yet another culture and the factor structure is, with minor variations, congruent with that of the original inventory.

The study with the bilinguals is another way of approaching cultural differences. The bilingual study demonstrated, to a certain degree, the linguistic equivalence of the English and Turkish versions, although further research with larger and more representative groups is needed. A wealth of research is beginning to accumulate, dealing with the relationship between language and self in bilinguals. Our research (Gülgöz, Schrauf & Rubin, 2001), as well as others' (Schrauf & Rubin, 1998; Marian & Neisser, 2000) on autobiographical memory shows that linguistic context determines the autobiographical memory retrieved by participants. These studies consistently observed congruence between the language of research context and the language of event in memory. Other reports indicate that during therapy, retrieval of events of childhood is easier when the therapy is conducted in the language spoken during childhood (Schrauf, 2000).

These findings point towards a differential conceptualization of self according to language. The consistency in the second study between the responses in two languages becomes a strong statement when examined on the background of such research. It may mean that the traits remain stable across the contexts of two languages and two cultures. Even though cultural shaping through language was expected to modify responses across the two languages, research by Watkins and Gerong (1999) has also failed to show such differences using the Twenty Statements Test.

Comparisons of the facets showing a significant difference across the two languages with those that are different in the Turkish and American samples may add to our understanding of cultural differences. The differences between the scores in two languages were in the facets of Vulnerability, Fantasy, Straightforwardness, and Altruism. Vulnerability and Straightforwardness seem to have equal means in American and Turkish samples. The Turkish sample has means that are in the upper part of the average range for the American sample in Altruism and Fantasy, and this is in agreement with the difference between the bilinguals' responses. Turkish culture has often been characterized as altruistic, and therefore the context of Turkish language may have stimulated the cultural responses. This is also consistent with the observation in the first study that the Altruism facet correlated with the Conscientiousness domain. Altruism represents social Conscientiousness in this culture, which is characterized by emotional interdependence (Kağıtçıbaşı, 1990). Research by Kuşdil and Kağıtçıbaşı (2000) has shown that values like benevolence are among those with the highest ratings among Turkish teachers. Other highly rated values were universalism, security, achievement, conformity, and openness to change. These ratings are in agreement with high means of the Turkish participants using the American norms on Openness and Conscientiousness domains and Achievement Striving facet. The high value placed on security may be related to the lower levels of Trust among the Turkish

participants.

Those facets for which the Turkish sample had a higher or lower mean compared to the American sample did not show a difference in the bilingual study. The absence of differences in the bilingual study should be interpreted with caution because of the small sample size, but it is also true that the sample is a distinct group from the general Turkish sample. They are highly educated, bilingual or multilingual, many had lived in the U.S., some for more than 10 years, and many were academicians. Therefore, it should come as no surprise that their results were considerably different from the overall sample.

Interpreting similarities. When we examine the results of the two studies reported here, we observe that there are minor variations in the cultural and linguistic representations of personality traits between Turkish and American groups. This also means that the Turkish sample fits well among other countries where similar findings were obtained (e.g., Heuchert, Parker, Stumpf, & Myburgh, 2000; Mastor, Jin, & Cooper, 2000; Piedmont & Chae, 1997). There are obvious difficulties in interpreting cultural similarities, as there are possible interpretations of differences. Berry, Poortinga, Segall, and Dasen (1992) indicate three ways of interpreting cultural differences in trait means. These interpretations can be applied to the factor structures of a trait model. One interpretation is that the difference in the factor structure reflects the differences between cultures in the conceptualization of the trait. A second interpretation is that the difference resulted from errors made in the translation of the items, or from the fact that some items have no corresponding verbalization in that particular culture. Finally, the difference may result from the complete irrelevance of the dimensions, traits, or the way personality is conceptualized. This may be the case, for example, if a culture regards behavior as totally variable, dependent on the contextual or situational factors without any stability of patterns. The real mistake would be to assume that all these interpretations are not called for if the factor structure appears to be similar, as it did in many studies. If there are no differences in the factor structures between cultures, can we automatically assume that the factor structure reflects identical underlying trait structures, that the test is identical in capturing the measures of interest in all cultures, and that behavior is conceptualized the same way in all cultures? No doubt, other corroborating evidence is sought for the similarities across cultures and across languages for the validity of the Five-Factor Model.

McCrae and Costa (1999) take the position of defending the biological deterministic perspective for the personality traits, arguing that the five dimensions are universal, and individual levels on these dimensions are biologically determined. Zuckerman (1995) had taken a similar position with five factors that were slightly different in identity than those of the Five-Factor Model (McCrae & Costa, 1999). Zuckerman's (1995) argument relied on the biological correlates of certain personality traits. He presented evidence that the monoamine systems played a significant role in personality. For example, low levels of MAO were related to Sociability (i.e., Extraversion), Impulsive Sensation-seeking (i.e., the reverse of Conscientiousness), and Aggression–Hostility (i.e., reverse of Agreeableness), and MAO levels were stable over long periods of time, increasing gradually with age. It is interesting to note that decrease in MAO levels coincides with decrease in Extraversion, and increase in Conscientiousness and Agreeableness, as would be expected from the correlations. Zuckerman (1995) states that traits are not inborn or inherited, but they are affected by the chemicals produced by the brain structures and chemical composition, which *are* inherited. In a similar vein, it can be argued that happiness is determined by the chemical composition in the brain, and optimists and extroverts are happier. However, there is also research casting doubt on such an argument. For example, there are substantial differences between nations in their subjective well being such that happiness correlates well with GNP per capita (Myers & Diener, 1995).

Are there any explanations for the similarities across cultures besides the assumption that there is some form of biological determination? Kağıtçıbaşı (1996) emphasized the adaptive function of certain personality characteristics to account for the similarities in personality within a culture. Certain personality characteristics were reinforced because they had adaptive value in that culture. If we pursue the same line of reasoning, it is possible that certain dimensions of personality become salient in societies because they have high adaptive value. It is also possible that in all human social life, regardless of cultural variations, there are unchanging characteristics, and the dimensions emerging in factor analyses are five dimensions of adaptation to all societies. All societies may have the same dimensions of adaptation and in all societies there would be individuals with varying degrees of adaptation to the society as a consequence of multiple causalities, biological and environmental.

An additional argument would be the transitions in cultures in the last century, in the midst of an

era of globalization. The effects of globalization have been argued by some to be in the direction of homogenization and by some to be in the direction of polarization (Holton, 2000). The homogenization thesis is generally simplified as the standardization of the global culture around a western or American pattern. The polarization argument counters this thesis with the argument that culture is harder to standardize than economic organization and technology. Even though there seems to be a convergence in economic systems around the world, nationalist and separatist movements are stronger than ever. Holton (2000) presents an alternative view called hybridization. It is the idea that cultures are in constant contact and interaction with each other. During this contact, which has been going on for centuries, the cultures borrow elements from each other and incorporate them into their own meaning system. It has become so hybrid in time that it is difficult to define an authentic culture that is pure and distinct from others. The multiplicity of meaning systems developed within a culture limits the ability to define the culture, whether it is the Turkish, German, South African, Malay, or American. An excellent case is language, an important aspect of culture. It is virtually impossible to find a pure language unaffected by any other language. Experts on the Turkish language vary in their estimation of foreign words in Turkish, but the most conservative estimate has been around 40%. It is clear that the definition of *foreign* is also problematic because it is impossible to find a point in time when a culture has not been in contact with any other. Even within one individual, language (and culture) changes with exposure to other languages. When an individual learns a second language, the result is not a person with two distinct languages but a person with a hybrid form of two languages (Grosjean, 1992) who switches between languages, borrows words from the other language, and uses idioms translated from the other language.

In investigating cultural differences, we may be examining differences between different forms of hybrids, not differences between cultures. The hybrids encompass a wide range of variations but they do not have the characteristics of any of the variations. The characteristics of hybrids resemble each other by virtue of being averages and that average may not be true of any single individual forming the hybrid. Consequently, the five domains that emerge in factor analysis may be the commonalities of the hybrids, the characteristics of the averages, but they may not be appropriate descriptions of individual personalities.

In conclusion, culture has been neglected in many areas of psychology for years. Validation and generalization of our theories necessitate research in many cultures and meticulous examination of the results of these studies. Cross-cultural comparisons may suggest universality or major differences but the interpretation of both types of outcomes requires extreme caution.

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