The Five-Factor Model of Personality Across Cultures

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THE NEO FIVE-FACTOR INVENTORY IN CZECH, POLISH, AND SLOVAK CONTEXTS

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Abstract. The principal aim of this chapter is to investigate the validity and the generalized applicability of the NEO Five-Factor Inventory (NEO-FFI) across three different countries and languages. These countries represent West Slavic branches of the Indo-European languages. We first examine the psychometric characteristics of the NEO-FFI (reliabilities, factor structure of the items, and congruence coefficients). Next, we compare four instruments proposed to measure the five personality dimensions, namely the NEO Five-Factor Inventory, the Five-Factor Personality Inventory, the Big Five Questionnaire, and the Czech Big Five Markers. We report data regarding their reliability and convergent and discriminant validity using multitrait-multimethod analysis and structural equation modeling. Finally, we compare Czech, Polish, and Slovak adolescents on the scales of the NEO-FFI.

Keywords: Factor structure, multimethod assessment, national character, adolescent personality

1. PERSONALITY IN THE SLAVIC WORLD

1.1. Language

There is one obvious similarity between Czechs, Slovaks, and Poles. They all speak very similar languages—from the Western perspective almost indistinguishable. At the present time the Slavic world comprises 13 languages, each with a distinct literary standard (Jakobson, 1955). In the usual classification they are divided into three groups: Eastern, Western, and Southern Slavic. Czech, together with Polish, Slovak and Upper and Lower Serbian (Lusatian), is a member of the West-Slavic group within the Slavonic branch of Indo-European languages (Stone, 1990). The long evolution of Protoslavonic (Primitive Slavonic), which took around three millennia, can be traced up to its final stage—the entrance of the Slavs onto the historical scene (ca. 6th Century),

the oldest foreign records of Slavonic proper and common nouns (ca. 7th Century), the formation of the first hereditary Slavonic states (10th century), the appearance of Slavonic written literature (9th Century), and the final dissolution of the Slavonic linguistic unity toward the beginning of the second millennium. However, many similarities have persisted up to the present time.

The dissolution of linguistic unity was accompanied by historical changes in Central and Eastern Europe, which resulted in the division of the region into two different cultural worlds founded on different religious systems: the world of Latin culture—*Slavia Romana*, and the world of Byzantine culture—*Slavia Orthodoxae* (Bobrownicka, 1995). This division can be easily recognized even in modern times. Thus, the Czech Republic, together with Poland, Slovakia, Croatia, and Slovenia, comprise Slavia Romana, while Russia, the Ukraine, Belarus, Bulgaria, Serbia (Yugoslavia) and Macedonia constitute Slavia Orthodoxae. Bosnia and Herzegovina comprise three cultural worlds, Latin, Byzantine, and Muslim.

Linguistic similarity does not imply cultural similarity (Bobrownicka, 1995). In the case of the Czech Republic, Slovakia and Poland, however, linguistic similarities are accompanied by similarities in both distant and more recent history and cultural heritage that connect this region to Western civilization (cf. Huntington, 1996).

Czech, Polish and Slovak languages are flexible languages—nouns and numerals are declined and verbs conjugated, there is de facto only one past tense, and there is a well-developed system of verbal aspects and voices. Around 10 million people speak the Czech language in the Czech Republic, about 5 million people speak Slovak in Slovakia, and about 39 million people speak Polish in Poland.

1.2. The Five-Factor Model of Personality in Czech, Polish, and Slovak Contexts

In the framework of the Five-Factor Model of personality two approaches are usually differentiated: lexical (taxonomic) and dispositional (questionnaire; John & Srivastava, 1999; Wiggins, 1997). For lexical researchers, the Five-Factor Model has been derived from lexical data; it is a model of personality attributes and it is, therefore, descriptive rather than explanatory (Saucier & Goldberg, 1996). In contrast, the Five-Factor Model in a dispositional approach is based on factor analyses of questionnaire scales. It is assumed that the five factors correspond to biological traits, which can explain behavior (McCrae & Costa, 1996; McCrae & Costa, 1999). Both approaches share another similarity as well: striving after completeness (in case of the questionnaire approach through the collection of many items from different questionnaires). From this point of view there is no theoretical distinction, because both are lexical in spirit. Both these approaches have been implemented in research on the Five-Factor Model in Czech, Polish, and Slovak. At the end of the last century Professor Alois Angleitner from the University of Bielefeld coordinated research projects aimed at verification of the validity of the Five-Factor Model of personality description in the Czech, Polish, and Slovak languages. Lists of personality-relevant adjectives and nouns were formed (in Czech, moreover, personality-relevant verbs were also listed) in the first phase of the lexical projects. The lists were reduced in the second phase according to the German classification system (Angleitner, Ostendorf, & John, 1990). Several studies concerning

this stage of the lexical project have been published in Czech (Hřebíčková, 1995), in Polish (Szarota, 1996), and in Slovak (Ruisel, 1997). The existence of the five-factor structure of personality description was confirmed in Czech by Hřebíčková (1997), and in Polish by Szarota (1997); lexical studies in the Slovak Republic have not been completed yet. Representative lexical studies have been performed in two other Slavonic languages as well: Russian (Shmelyov & Pokhil'ko, 1993) and Croatian (Mlačić, 2000).

The factors of the Czech five-factor structure were labeled Extraversion/Surgency (I), Agreeableness (II), Conscientiousness (III), Emotional Stability (IV), and Intellect (V) and provide a fairly typical version of the five-factor structure. Although some subtle differences may be observed, the Polish five-factor structure also seems to be a fair version of the Big Five. Agreeableness (II), Conscientiousness (III) and Intellect (V) were virtually identical to the American-English structure. However, the Extraversion (I) factor had no sociability facet, and Emotional Stability (IV) included content related to self-control.

Czech and Polish five-factor structures have been used in cross-cultural comparisons. De Raad in recent times has instigated several studies comparing five-factor structures in different languages (De Raad, Perugini, & Szirmák, 1997; De Raad, Di Blas, & Perugini, 1998, De Raad, Perugini, Hřebíčková, & Szarota, 1998). In a recent review De Raad, Perugini, Hřebíčková, and Szarota (1998) compared seven languages (English, Dutch, German, Hungarian, Italian, Czech, and Polish). Within each language, terms that had clear English equivalents in the Goldberg (1992) structure were identified, and congruence coefficients were calculated in the different languages, using the American English solution as a benchmark. The Polish five-factor structure corresponds with the American English better than the Czech one. Peabody and De Raad (2000) chose another strategy for a comparison of structures across languages. They used a qualitative examination of factor content, looking carefully at the content of factors derived from the five-factor structures in different languages (Hungarian, Dutch, Polish, Czech, and two independent Italian lexical studies were used). The overall framework within which the comparisons were carried out was a version of the Big Five presented in Peabody and Goldberg (1989). From this comparison it followed that the contents of the Agreeableness (II) and Intellect (V) factors are similar whereas the contents of Conscientiousness (III), Extraversion (I), and Emotional Stability (IV) differ in the Czech and Polish models. The Polish Extraversion factor contains characteristics of persistence, which in the Czech are incorporated in the Conscientiousness factor. Irritableness and fearfulness are included in one factor—Emotional Stability—in the Czech. The Polish fourth factor represents only Irritableness, and the Polish five-factor structure does not comprise Fearfulness.

The dispositional (questionnaire) approach to the Five-Factor Model has been elaborated primarily by Costa and McCrae. Their Five-Factor Theory of personality (McCrae & Costa, 1999) and their instrument, the NEO Personality Inventory, were originally developed in the context of longitudinal studies of personality and aging. The short version, the NEO Five-Factor Inventory (NEO-FFI; Costa & McCrae, 1992), has been translated into Czech, Polish, and Slovak, and has been used in several research projects. The NEO-FFI was first applied as a validity criterion in the Czech

(Hřebíčková, 1993) and the Polish (Szarota, 1997) lexical studies. The correlations of the NEO-FFI scales with factors derived from the representative Czech and Polish five-factor structures were examined. The Czech version of the instrument was used in further research (e.g. Blatný, in press; Macek, Osecká, Hřebíčková & Bernard, 1998; Macek, Hřebíčková & Čermák, 1999; Řehulka & Řehulková, 1999; Štěpaníková & Macek, 1997), and a *Professional Manual* of the Czech version of the NEO-FFI by Hřebíčková and Urbánek (2001) is available for Czech psychologists. Zawadzki, Strelau, Szczepaniak, and Sliwinska (1998) are the authors of the Polish NEO-FFI *Manual*. A Slovak version of the NEO-FFI was developed by Ruisel (1998) and was used by Ficková (1999; 2000), Orlická (2001), Ruiselová (2000), and Stríženec and Ruisel (1998).

2. PSYCHOMETRIC PROPERTIES OF THE CZECH, POLISH, AND SLOVAK NEO FIVE-FACTOR INVENTORIES

The purpose of the first study is to evaluate the psychometric integrity of the Czech, Polish, and Slovak translations of the NEO-FFI. For each national version of the NEO-FFI, internal consistency of the scales was examined. Item-level principal component analysis was performed, and factor congruence coefficients were calculated to compare the similarity of the NEO-FFI across cultures.

Subjects. The Czech version of the NEO-FFI was administered to 945 subjects (417 males, 518 females, 10 did not indicate their gender). Mean age of the sample was 24.34 years (range = 14-81, 15 subjects did not indicate their age, SD = 13.16). The participants represented a wide range of educational, cultural, and social backgrounds. The Polish sample consisted of 350 subjects (157 boys and 193 girls) with mean age 16.6 years, SD = 1.1. The Slovak subjects were 516 adolescents (209 boys, 300 girls, 7 did not indicate their gender); mean age of the sample was 16.49 years (range = 14-23, SD = 1.8).

Measure. The scales of the NEO Five-Factor Inventory (Costa & McCrae, 1992) are: a) Neuroticism, reflecting anxiety, hostility, depression, self-consciousness, impulsiveness, and vulnerability; b) Extraversion, comprising warmth, gregariousness, assertiveness, activity, excitement-seeking, and positive emotions; c) Openness to Experience in the areas of fantasy, aesthetics, feelings, actions, ideas, and values; d) Agreeableness, reflecting altruism, sympathy, trust, and nurturing tendencies and; e) Conscientiousness, comprising organization, punctuality, achievement, and honesty.

The NEO-FFI is a shortened version of the NEO Personality Inventory and includes many of its better aspects. The NEO-FFI comprises 60 self-report items, 12 items for each of the personality domains.

Two psychologists independently translated the original version of the NEO-FFI. The preliminary Czech version of the items was formulated through comparison of both translations. Afterwards, the back translation of the NEO-FFI was done by the translator and reviewed by the authors of the original version. Eight problematic items were

Table 1. Reliability (Cronbach alpha) of NEO-FFI Scales in Six National Samples.

NEO-FFI Scales	C	P	S	G	Can	US	M
Neuroticism	.81	.82	.79	.85	.87	.86	**.83**
Extraversion	.79	.80	.78	.80	.84	.77	**.79**
Openness	.60	.69	.66	.71	.73	.73	**.68**
Agreeableness	.70	.73	.69	.71	.75	.68	**.71**
Conscientiousness	.84	.84	.83	.85	.81	.81	**.83**
Mean	**.75**	**.77**	**.75**	**.78**	**.80**	**.77**	

Note. C = Czech sample, P = Polish sample, S = Slovak sample, G = German sample (Borkenau &Ostendorf, 1993), Can = Canadian sample (Holden & Fekken, 1994), US = American sample (Costa & McCrae, 1992).

reformulated and the final Czech version of the NEO-FFI was used in this research. Analogous strategies were used in the formulation of the Polish and Slovak versions.

2.1. Results

Reliability. Table 1 gives the internal consistencies for the five scales of the NEO-FFI in six national samples, namely Czech, Polish, Slovak, German, Canadian, and American. None of the scales showed an alpha lower than 0.60. The mean alpha reliability of the NEO-FFI scales was highest in Canadian sample (.80), followed by German sample (.78). Mean reliability of the Polish NEO-FFI was as high as the mean reliability obtained for the American normative data (.77). The lowest mean reliabilities were found in the Czech and Slovak versions of the NEO-FFI (.75). The most reliable scales in the NEO-FFI are Neuroticism and Conscientiousness (mean reliability = .83), while Openness showed lowest mean reliability in the six samples (.68).

Factor analysis. An explanatory principal components analysis with five components rotated by varimax was undertaken on the item intercorrelations. We were interested in comparing five-factor solutions across national samples so we did not address the issue of alternative numbers of factors. The first ten eigenvalues in the Czech sample were 7.51, 4.22, 3.69, 3.49, 2.47, 1.57, 1.41, 1.35, 1.16, and 1.11; in the Polish sample they were 7.57, 4.51, 3.98, 3.65, 2.40, 1.80, 1.52, 1.38, 1.37, and 1.32; and in the Slovak sample, 7.45, 4.39, 3.58, 3.02, 2.47, 1.86, 1.66, 1.40, 1.30, and 1.27. The percentages of variance explained by the five factors were 35.68% (Czech), 36.85% (Polish), and 34.85% (Slovak). The varimax-rotated factor structures are shown in Table 2.

In the Czech sample, 52 of 60 items had loadings greater than or equal to .30 on the correct NEO-FFI factor. Eight of the Czech items did not load on the expected factor. The discrepancies were due to two items expected to measure Extraversion (27, 57), four items from the Openness to Experience scale (8, 18, 28, 38), and two items from the Agreeableness scale (29, 34). With the exception of two items from the Openness

Table 2. Item Factor Analysis of the Czech, the Polish, and the Slovak NEO-Five-Factor Inventory.

		N			E			O			A			C			h^2		
Factor	Item	*C*	*P*	*S*	*C*	*P*	*S*	*C*	*P*	*S*	*C*	*P*	*S*	*C*	*P*	*S*	*C*	*P*	*S*
Neuroticism																			
	1	**.43**	**.41**	**.41**	−.17	−.28	−.07	.01	.17	−.04	.11	.01	.22	−.07	.02	−.06	.24	.28	.23
	6	**.62**	**.60**	**.57**	−.02	−.08	−.19	.06	.00	.01	.07	.16	−.07	−.10	−.13	−.03	.41	.42	.38
	11	**.53**	**.55**	**.65**	−.11	.11	.04	.01	.11	.11	.10	.00	−.06	.19	−.01	−.03	.35	.34	.44
	16	**.36**	**.48**	**.31**	**−.30**	**−.47**	−.26	.23	.10	.13	−.06	−.09	.09	−.11	−.17	−.07	.30	.52	.20
	21	**.66**	**.74**	**.67**	−.14	−.07	−.12	−.03	.01	.02	−.12	−.02	−.05	.01	.03	−.04	.48	.56	.47
	26	**.65**	**.59**	**.67**	−.13	−.14	−.17	.11	.11	.11	−.02	.12	−.07	−.11	−.23	−.12	.47	.46	.52
	31	**.53**	**.50**	**.42**	−.13	−.29	−.24	.08	.04	.16	.18	.04	.14	−.16	−.13	−.06	.37	.36	.29
	36	**.38**	**.55**	**.42**	.14	.01	.05	−.06	−.07	.01	**−.40**	**−.31**	−.13	.01	−.03	−.00	.34	.41	.20
	41	**.56**	**.42**	**.48**	−.03	.00	−.02	−.13	−.00	−.02	.00	−.09	.12	−.27	**−.32**	−.27	.41	.30	.32
	46	**.42**	**.50**	**.36**	**−.36**	**−.47**	**−.34**	.14	.06	.15	−.04	−.10	.09	−.07	−.09	−.08	.34	.51	.29
	51	**.66**	**.60**	**.66**	.07	−.08	.05	.02	.05	−.01	.00	.11	.06	−.16	−.23	−.12	.48	.45	.46
	56	**.56**	**.52**	**.52**	−.06	.00	.04	.10	−.05	.01	−.10	.16	−.02	−.17	−.17	−.03	.38	.34	.28
Extraversion																			
	2	.03	.10	.02	**.66**	**.64**	**.60**	−.01	.15	−.03	−02	−.01	.10	.06	−.14	.03	.45	.47	.38
	7	.04	.12	.11	**.64**	**.57**	**.63**	.07	−.03	.03	.07	.14	.16	−.03	−.14	−.03	.43	.38	.44
	12	−.18	−.25	−.20	**.63**	**.31**	**.54**	−.02	.04	.03	.03	−.13	.28	−.14	**−.30**	−.01	.45	.27	.42
	17	−.02	−.03	.02	**.68**	**.59**	**.69**	.07	.24	−.01	.00	.07	.10	.10	.04	.10	.49	.42	.51
	22	−.04	−.08	−.11	**.61**	**.59**	**.55**	.03	.17	.11	−.12	−.13	−.21	.00	−.08	.04	.40	.42	.38
	27	.03	−.07	.07	.19	**.39**	.17	−.13	−.02	−.12	.21	.20	.27	−.24	−.21	−.18	.16	.25	.16
	32	−.15	−.06	−.08	**.50**	**.55**	**.60**	.15	.19	.10	**−.30**	−.09	−.11	.13	.17	.24	.42	.39	.45
	37	−.20	−.15	−.17	**.70**	**.74**	**.67**	.06	−.05	−.09	.06	−.04	.11	.11	.11	.12	.56	.59	.52
	42	**−.33**	**−.30**	−.26	**.55**	**.52**	**.37**	.04	.03	.12	.12	.08	.13	.01	.05	.08	.44	.38	.25
	47	−.14	.02	−.03	**.33**	**.50**	**.50**	−.02	.17	−.06	**−.35**	−.11	−.27	.15	.24	.11	.29	.35	.35
	52	−.17	−.04	−.08	**.47**	**.65**	**.49**	.20	.17	.02	−.21	−.20	−.13	**.33**	.29	**.38**	.45	.59	.42
	57	−.15	−.06	−.05	.19	**.43**	.28	−.05	−.08	.13	.18	**−.31**	.10	.13	.12	−.04	.12	.31	.12
Openness																			
	3	.15	.10	.22	−.06	.07	−.04	**.36**	**.36**	**.36**	.09	.10	.25	−.29	−.09	−.18	.26	.17	.29
	8	−00	−.16	−.04	−.11	−.02	−.01	−.03	.22	**.69**	.03	−.06	.05	**−.39**	−.20	.09	.17	.12	.50
	13	.05	−.01	.17	.04	−.01	.19	**.69**	**.67**	**.56**	.07	.02	−.07	.10	.06	.10	.50	.45	.40
	18	−.23	−.09	−.18	.00	.06	−.01	.28	**.31**	**.32**	.10	−.03	.13	−.18	−.13	.08	.18	.13	.16
	23	−.02	.07	.11	.06	.08	.08	**.58**	**.69**	**.50**	.11	−.01	−.01	.04	.00	.02	.36	.50	.28
	28	.03	−.09	−.05	**.33**	.22	**.32**	.15	**.34**	.21	−.25	−.20	−.13	.07	.08	.02	.21	.23	.17
	33	.07	.01	.07	.05	.07	.01	**.36**	**.40**	.27	.27	.18	.19	−.01	.10	.04	.22	.22	.12

Table 2 (continued)

Factor	Item	N			E			O			A			C			h^2		
		C	*P*	*S*	*C*	*P*	*S*	*C*	*P*	*S*	*C*	*P*	*S*	*C*	*P*	*S*	*C*	*P*	*S*
	38	−.10	−.13	−.15	−.01	.04	.08	−.16	.12	−.06	−.03	**−.31**	.16	−.04	−.14	−.12	.04	.15	.08
	43	.04	.06	.12	.04	.05	.13	**.67**	**.73**	**.64**	.01	.01	−.02	.05	.03	.02	.46	.55	.45
	48	−.00	.04	.05	−.00	−.05	−.08	**.59**	**.62**	**.51**	−.04	−.02	.10	−.08	.07	.02	.36	.40	.28
	53	−.13	.09	−.05	.09	.14	.13	**.48**	**.49**	**.40**	−.15	−.18	−.17	**.32**	.28	**.45**	.40	.39	.42
	58	.10	.11	−.02	.05	.07	−.00	**.58**	**.48**	**.68**	−.24	−.01	−.14	−.09	−.00	−.03	.42	.25	.49
Agreeableness																			
	4	.07	.03	.20	.05	.02	**.35**	.21	−.00	.05	**.37**	**.49**	.26	**.43**	.27	**.33**	.38	.32	.35
	9	−.29	**−.38**	−.22	−.10	−.07	−.00	.02	.03	.07	**.43**	**.35**	**.33**	.26	.19	.29	.36	.32	.25
	14	−.08	−.17	−.10	.17	.02	.15	−.05	−.16	.02	**.56**	**.53**	**.58**	.13	.02	.07	.37	.35	.38
	19	.23	.16	.20	.14	.00	**.30**	.00	.03	.03	**.39**	**.57**	.24	.15	.03	.11	.25	.36	.21
	24	−.17	−.08	−.06	.00	.15	.23	.08	.16	.17	**.38**	**.50**	**.42**	.20	.16	−.11	.23	.34	.28
	29	−.24	−.04	−.17	.15	−.01	.12	.22	.12	−.07	.18	.25	**.37**	−.21	−.07	.00	.22	.09	.19
	34	−.08	.16	−.06	**.42**	**.34**	**.51**	.02	−.06	.01	.29	.24	.24	.14	.20	.26	.29	.25	.40
	39	−.03	.01	−.05	.22	.17	.16	.04	−.12	.12	**.62**	**.56**	**.66**	.04	−.13	.06	.44	.38	.49
	44	−.00	.05	.24	.20	−.08	−.00	.01	.07	.05	**.52**	**.59**	**.40**	−.09	−.27	−.16	.33	.44	.25
	49	.09	.22	.28	.14	.27	.22	.27	.26	.22	**.40**	**.45**	.21	**.32**	.26	**.32**	.38	.47	.34
	54	.05	.04	.09	−.09	−.18	−.22	.01	−.11	−.06	**.37**	**.52**	**.40**	−.07	.00	.09	.15	.32	.24
	59	.09	.00	.19	−.08	−.13	−.15	.04	.03	.05	**.55**	**.64**	**.59**	−.03	−.02	−.01	.33	.44	.42
Conscientiousness																			
	5	.01	−.09	.13	.02	−.12	.06	−.07	.03	.00	.18	.07	.15	**.64**	**.45**	**.56**	.45	.24	.36
	10	−.12	−.08	−.16	.03	.15	.16	−.06	−.01	−.08	.00	−.05	−.02	**.63**	**.63**	**.60**	.42	.44	.42
	15	−.16	−.10	−.16	.05	−.06	.03	−.10	−.06	.06	.06	.00	.16	**.52**	**.60**	**.47**	.32	.39	.29
	20	.11	−.00	.12	−.05	.06	.01	.02	.02	.12	.14	.14	.05	**.69**	**.60**	**.71**	.52	.39	.55
	25	−.06	−.18	−.09	.09	.05	.12	.04	−.01	−.04	−.23	−07	−.25	**.64**	**.65**	**.63**	.48	.47	.49
	30	**−.31**	−.24	−.23	−.06	−.09	−.00	−.04	.06	−.04	.13	.11	.04	**.51**	**.56**	**.46**	.39	.40	.28
	35	−.06	.07	−.05	.18	.05	.15	.03	.00	−.05	**−.32**	.03	−.20	**.58**	**.69**	**.71**	.49	.49	.58
	40	−.07	−.09	−.04	.02	.17	.14	.05	.00	.05	.17	.00	.08	**.56**	**.51**	**.62**	.35	.30	.43
	45	−.15	−.28	−.17	−.08	.01	−.09	−.07	−.01	.07	.21	−.02	.29	**.46**	**.41**	**.45**	.30	.25	.34
	50	−.13	−.15	−.18	.08	.07	.17	.00	.01	.05	−.03	−.03	−.10	**.64**	**.70**	**.60**	.45	.52	.45
	55	−.27	−.25	−.23	.13	.03	.00	−.01	.06	.03	.22	.01	**.34**	**.43**	**.59**	**.43**	.33	.43	.36
	60	−.00	.01	−.00	.14	.21	.04	.13	.19	.08	−.28	−.17	−.20	**.53**	**.48**	**.60**	.38	.35	.42

Note. Loadings ≥ 0.30 are listed in bold. *Ns* = 945 for Czech (C), 350 for Polish (P), and 516 for Slovak (S) samples.

Table 3. Comparison of Czech, Polish, Slovak, American, And German NEO-FFI Item Factors.

	N	E	O	A	C	M
C – P	0.94	0.92	0.90	0.84	0.95	**0.91**
C – S	0.96	0.94	0.83	0.89	0.93	**0.91**
C – U	0.95	0.93	0.91	0.86	0.95	**0.92**
C – G	0.95	0.93	0.85	0.92	0.95	**0.92**
P – S	0.94	0.91	0.85	0.75	0.93	**0.88**
P – U	0.94	0.94	0.90	0.85	0.93	**0.91**
P – G	0.95	0.92	0.90	0.88	0.96	**0.92**
S – U	0.91	0.91	0.83	0.79	0.93	**0.88**
S – G	0.94	0.93	0.90	0.86	0.96	**0.92**
U – G	0.94	0.93	0.88	0.93	0.93	**0.92**
Mean	**0.94**	**0.93**	**0.88**	**0.86**	**0.94**	**0.91**

Note: C = Czech, P = Polish, S = Slovak, U = United States, G = German. These are congruence coefficients between five rotated factors derived from principal component analysis of the 60 NEO-FFI items in each country.

scale (8, 38) and two items from the Agreeableness scale (29, 34), the items of the Polish NEO-FFI loaded most highly on the appropriate factor. In the Slovak sample, 51 of the 60 items marked the appropriate factors with loadings ≥ 0.30; nine items did not load on the intended factor: two from Extraversion (27, 57), three from Openness (28, 33, 38), and four from Agreeableness (4,19,34, 49).

Congruence coefficients. The similarity of the NEO-FFI item factor structures in five languages was assessed by means of congruence coefficients (McDonald, 1991) between the varimax-rotated principal components. We compared the varimax-solutions in the three West Slavic languages with the results of a previous factor analysis carried out by Borkenau and Ostendorf (1993) on German normative data and with a factor analysis of American data published by Parker and Stumpf (1998). In the latter study academically talented young people (mean age of 12 years) were used as subjects.

The results (see Table 3) showed the highest mean congruence was between German and other NEO-FFI structures. When the congruence coefficients among the three West Slavic languages were compared, the highest congruence was observed between the Czech and the Slovak factors, and between the Czech and the Polish factors, whereas a slightly lower congruence was found between the Polish and Slovak factors. The Neuroticism and Conscientiousness factors showed the highest mean congruences, the Agreeableness factor the lowest.

2.2. *Discussion*

The present results indicate that almost all scales fulfilled the .70 level criterion

recommended by Nunnally (1978) for an alpha coefficient. The Openness to Experience scale does not exceed this level in any of the three national samples, consistent with the results of factor analyses reported above. The Agreeableness scale also has a low internal consistency in the Slovak sample. If we compare these findings with the German, Canadian, and American results, we can see that alpha coefficients of these two scales are also lowest in these samples. Items 27 and 57 from the Extraversion scale did not load highly on the factor in the Czech and Slovak samples, whereas in the Polish, American, and German structures they have adequate factor loadings. Both items indicate that the respondent prefers individual work over work with others. For Czechs and Slovaks, these items are probably not suitable as indicators of (low) Extraversion.

Four items of the Openness to Experience scale have factor loadings less then 0.30 and thus they are not included in Openness to Experience in the Czech sample; similarly, two in the Polish and three in the Slovak sample fail to load as intended. This finding led us to think over again the cultural adequacy of these "bad" items. It seems to us that the content of item 18 is experience-based in Western cultures, but does not express the real life experience of people in post-communist countries. We can suppose that people from former communist countries will differ from persons living in democratic countries mainly on the Openness to Experience scale. Angleitner and Ostendorf (2000) compared personality traits in residents of the former East and West Germanys. Personality profiles for the two samples were virtually identical, but former East Germans scored about one quarter standard deviation lower in Openness than former West Germans. For example, item 18, "I believe letting students hear controversial speakers can only confuse and mislead them," is clear for people living in Western countries. But an individual who has lived 40 years under a totalitarian regime can feel that acceptance of different approaches and views is difficult. This item is not included in any factor in the Czech sample and has a lower loading in the Polish and Slovak samples in comparison to American and German factor loadings. Item 28, asking whether respondents often taste new and exotic meals, makes sense only in countries where the availability of exotic meals and travel opportunities has not been interrupted by political development. These items are problematic in the Czech and Slovak NEO-FFI versions, but also in the German sample. We can also speculate about the national mentality as an interpretation of very divergent findings related to this item in individual nations. Item 38, asking whether people are guided in their decisions by the opinions of religious authorities, does not load on the Openness to Experience factor in any five-factor structure, including the adolescent American structure (see Parker & Stumpf, 1998) and the Russian version of the questionnaire (R. R. McCrae, personal message, March 1996). We can carefully form a tentative conclusion that (church) authorities are not so important in the life of adolescents (or, when they are, adolescents deny it). The weak internal reliability of the Openness to Experience scale was largely caused by the four items, 8, 18, 28, and 38. A similar set of potentially weak NEO-FFI items also exists within the Agreeableness scale. Item 29 failed to mark the factor in the all matrices except Slovak and item 34 is problematic in all four matrices except German. For the new revision of the NEO-FFI Parker and Stumpf (1998) suggest replacing problematic items of Openness to Experience and Agreeableness scales with

more appropriate items from the rich item pool of the NEO-PI-R. We can agree with this statement. Eight problematic items in the Czech NEO-FFI version were reformulated and the revised version was used in several research studies (Hřebíčková & Urbánek, 2001). In this new study 55 of the 60 items had loadings ≥ .30 on the correct NEO-FFI factor. Four of these five reformulated items—57 (E), 8, 38 (O) and 29 (A)—are still problematic.

Results showed higher congruence between the German and the American factors than among Slavonic languages. Low mean congruence of the factors Agreeableness and Openness to Experience was already expected on the basis of an inspection of the factor patterns reported in Table 2.

3. A COMPARISON OF FOUR MEASURES OF THE FIVE-FACTOR MODEL

In addition to increasing interest in the application of the Five-Factor Model not only in research but also in clinical and applied settings, there is interest in instruments for reliably measuring individual dimensions. These instruments can be classified into two major groups. Self-rating inventories belong to the first group, in which adjectives are used. Examples are Goldberg's Big Five adjective markers (Goldberg, 1990, 1992) and their reduced version (Saucier, 1994), the Revised Interpersonal Adjective Scales-Big Five (IAS-R-B5; Trapnell & Wiggins, 1990), the 23 Bipolar Big Five questionnaire (23BB5; Duijsens & Diekstra, 1995), the Short Adjective Checklist to measure the Big Five (SACBIF; Perugini & Leone, 1996) and the Czech Big Five Markers (CBFM; Hřebíčková, Urbánek, & Čermák, 2000). Instruments in the second group use items formulated as short sentences. Internationally, the Revised NEO Personality Inventory (NEO-PI-R; Costa & McCrae, 1992) is the most widely validated instrument to assess the Five-Factor Model. In Europe two others five-factor based inventories have arisen : in The Netherlands the Five-Factor Personality Inventory (FFPI; Hendriks, 1997) and in Italy the Big Five Questionnaire (BFQ; Caprara, Barbaranelli, Borgogni, & Perugini, 1993). John, Donahue, and Kentle (1991) constructed the Big Five Inventory (BFI) containing a short-phrase item format more concrete than Goldberg´s single adjective items but of lower complexity than the sentence format used by NEO questionnaires. A number of studies have reported on the psychometric characteristics of each instrument and some studies have compared two or more instruments with each other (e.g. Goldberg, 1992; McCrae & Costa, 1987; Benet-Martínez & John, 1998; John & Srivastava, 1999; Perugini & Ercolani, 1998; Mooradian & Nezlek, 1996; Rosendahl, 1977; Scharf, Tuente, Brinkmeier, & Benne, 1996).

The goal of our second study is to assess convergent and discriminant validity of the five personality dimensions as measured by several questionnaires. The Czech version of the NEO-FFI was compared with three other instruments to assess five basic personality dimensions. Two of them are translated instruments—the FFPI and the BFQ—and one was originally developed in the Czech language, the CBFM. We examined a multitrait-multimethod (MTMM) correlation matrix and used structural equation modeling on a covariance matrix. We also addressed the question of the orthogonality of the Big Five-Factors.

3.1. Method

Sample and procedure. The sample included 253 individuals (135 males, 116 females, 2 did not indicate their sex; age18-62, M = 35.51 years, SD = 12.53 years). The educational level was above average.

Instruments. The revised Czech version of the NEO-FFI, together with FFPI, BFQ, and CBFM were used in the study. *The Five-Factor Personality Inventory* (FFPI) by Hendriks (1997) was based on the Abridged Big Five Circumplex taxonomic model of traits (AB5C model; Hofstee, De Raad & Goldberg, 1992). The model accounts for the fact that a simple structure in which traits are associated with just one underlying dimension is generally not encountered in the area of personality and individual differences. However, few traits have more than two sizeable factor loading. The AB5C model therefore represents trait variables by their projections in a circumplexical plane defined by the two factors on which they have their highest loadings. The FFPI consists of 100 brief and concrete statements, 20 items for each scale. Items were written in the third person singular. This formulation may stimulate the respondent to take an objective perspective. Elementary sentences were constructed (e.g. "helps others") and negations were excluded. In contrast to all other personality questionnaires, the authors excluded all dispositional adjectives and nouns, and used only observable, concrete, and behavioral items, which were represented by verbs. The fifth basic factor was called Autonomy (for Intellectual Autonomy), and the items emphasize the capability to make independent decisions, to resist social pressures to conform, and to maintain an independent opinion on topics. The cross-cultural replicability and generalizability of the five-factor structure shows that the relationships among the 100 trait variables in the FFPI are largely invariant across 13 cultures (Hendriks et al., in press).

The Big Five Questionnaire was constructed by Caprara, Barbaranelli, Borgogni, and Perugini (1993). The BFQ comprises 132 phrases equally distributed over its 10 facet scales, plus a Lie scale, which contains 12 items. The Lie scale was designed to assess socially desirable responding. The Italian authors labeled the first of the Big Five dimensions *Energy*. This dimension is organized into the following two facets: Dynamism, which refers to expansiveness and enthusiasm, and Dominance, which refers to assertiveness and confidence. The dimension usually labeled Agreeableness is labeled Friendliness in the Italian questionnaire and is organized into two facets: Cooperativeness/Empathy, which refers to concern and sensitiveness towards others and their needs, and Politeness, which refers to kindness, civility, docility, and trust. The Conscientiousness dimension is organized into two facets: Scrupulousness, which refers to dependability, orderliness, and precision, and Perseverance, which refers to the capability of fulfilling one's own tasks and commitments. The Emotional Stability dimension was organized into two facets: Emotion Control, which refers to the capacity to cope adequately with one's own anxiety and emotionality, and Impulse Control, which refers to the capacity to control irritation, discontent, and anger. The Openness dimension is organized into two facets: Openness to Culture, which refers to the broadness or narrowness of one's own cultural interests, and Openness to Experiences,

which refers to openness to novelty and tolerance of different values. Each facet scale contains 12 items; half are positively worded, half negatively.

Czech Big Five Markers. The fourth instrument in our study was the Czech Big Five markers by Hřebíčková, Urbánek and Čermák (2000). The CBFM contains 60 bipolar rating scales, 12 for each of the 5 factors, and they were selected from two sources. The first source was a representative taxonomy of Czech personality descriptive adjectives (Hřebíčková, 1995; 1997). From the Dictionary of Standard Czech (Academia, 1989) containing approximately 28,000 adjectives, all 4,145 potentially personality-relevant adjectives were selected using the German classification system (Angleitner, Ostendorf, & John, 1990). In a classification task, six judges assigned the 4,145 terms to the 13 categories. Only those adjectives assigned by a majority of the judges to the category of Dispositions were chosen to represent the domain of trait terms. This procedure resulted in 366 adjectives that were rated by 397 subjects. A principal components analysis was performed and five varimax-rotated factors were retained. The major factors of the Czech personality language could be interpreted as the Big Five. The analysis confirmed the generalizability of the Five-Factor Model in the Czech language as well as the robustness of the Big Five across different samples of variables, rating inventories, and groups of raters (Hřebíčková, 1997). The second source was an analysis of a comprehensive sample of bipolar adjective rating scales (Big Five markers) previously used by several American authors (Goldberg, 1989; John, 1983; McCrae & Costa, 1987; Norman, 1963; Peabody, 1984; Peabody & Goldberg, 1989). Altogether 171 scales were translated into the Czech language and self-ratings from 418 Czech subjects were collected. A principal component analysis with varimax rotation was performed. The five-factor solution represented a clear demonstration of the Big Five factors. From these two sources three experts selected 60 bipolar adjective rating scales representing the Big Five in the Czech language. Adjectives with the highest factor loading for each dimension were chosen and, in addition, facets for Extraversion, Agreeableness, and Intellect/Openness were determined in advance. Adjectives representing Extraversion describe sociability, activity, and talkativeness, which are the main facets of the Czech Extraversion/Surgency factor. Adjectives representing Agreeableness describe relationships to other people and morality. Six bipolar adjective rating scales represent Intellect and six represent Openness to Experience.

3.2. Results

The reliabilities of the scales are given in Table 4. All alpha coefficients are at satisfactory levels. Overall, the reliabilities were impressive for these relatively short rating scales, with the CBFM (mean of .88), followed by the FFPI (.86), the BFQ (.80), and the NEO-FFI (.79). Across instruments, Conscientiousness, Neuroticism (vs. Emotional Stability) and Extraversion (Energy) were measured most reliably, whereas Openness (Autonomy, Intellect/Openness) and Agreeableness were measured less reliably.

Table 5 is the MTMM correlation matrix. Simple inspection of the matrix reveals the similarities of pattern in the submatrices of intercorrelations of the individual methods. There are always quite high correlation values at the diagonal and rather small values (although sometimes statistically significant) in the off-diagonal cells. The

Table 4. Reliability of the NEO-FFI, FFPI, BFQ, and CBFM.

Instrument	N	E	O	A	C	*M*
NEO-FFI	.81	.81	.75	.73	.83	**.79**
FFPI	.88	.86	.85	.82	.86	**.86**
BFQ	.86	.78	.79	.77	.80	**.80**
CBFM	.86	.92	.83	.86	.93	**.88**
Mean	**.85**	**.84**	**.81**	**.80**	**.86**	**.83**

Note. N = Neuroticism or Emotional Stability, E = Extraversion or Energy, O = Openness, Intellect, or Autonomy, A = Agreeableness or Friendliness, C = Conscientiousness.

values in the diagonals of the submatrices are indicators of the convergent validity (negative values are due to reversed orientation of the correlated scales). The values imply a reasonable degree of convergent validity. The values in the off-diagonal cells are indicators of discriminant validity. In our opinion it is not realistic to expect zero correlations between different Big Five scales but rather similar patterns of scale intercorrelations in each submatrix. Although results of factor analyses of the Big Five data are usually reported in orthogonally rotated form, we suppose that nonzero correlations between scales can be expected.

Across all five factors and all instruments, the mean of the convergent validity correlations was .60. The FFPI/CBFM showed the strongest convergence (mean r = .64), followed by the NEO-FFI/BFQ and NEO-FFI/FFPI (both mean r = .63). The lowest convergence was found between the FFPI and the BFQ (mean r = .53). Across instruments mean validities ranged from .69 (Neuroticism) to .48 (Openness). In fact, the correlations are attenuated by less-than-perfect reliabilities of the instruments and disattenuation would raise them.

Overall, the discriminant correlations were low; the absolute values averaged .17 for the NEO-FFI, .19 for the FFPI, .18 for the BFQ, and .20 for the CBFM. Ten of the discriminant correlations reached .40, with the largest correlation (.57) between BFQ Energy and FFPI Autonomy.

As a more formal test of convergent and discriminant validity, we used structural equation modeling for the analysis of this MTMM matrix. The covariance matrix was used in these analyses. Several models were estimated, but during the estimation phase problems with inappropriate parameter values were encountered in some of them, which often happens in this type of model, due to identification problems probably caused by two mutually orthogonal sets of factors (Wothke, 1996). We report three models: a model with orthogonal trait factors (model M1), a model with correlated trait factors (model M2), and a model with correlated trait factors and correlated method factors (M3). Model M1 corresponds with the standard Big Five model, model M2 represents its alternative with correlated factors and model M3 assumes the existence of method factors. The latter model also assumes that these method factors are correlated; it is possible to argue that three self-report questionnaires and one rating inventory in fact do not represent distinct methods.

Table 6 summarizes the overall fit of the three models. Models M2 and M3 are nested in model M1, so we can directly compare their chi-square values. Improvement

Table 5. Multitrait-Multimethod Matrix for NEO-FFI, FFPI, BFQ, and CBFM.

		NEO-FFI					FFPI					BFQ					CBFM				
		N	E	O	A	C	ES	E	Au	A	C	ES	En	O	F	C	ES	E	I/O	A	C
NEO-FFI	N																				
	E	−.31																			
	O	−.02	.18																		
	A	−.12	.04	.04																	
	C	−.29	.06	−.07	.00																
FFPI	ES	**−.72**	.26	.03	.16	.33															
	E	−.23	**.74**	.03	.10	.06	.20														
	Au	−.49	.30	**.30**	−.19	.45	.52	.28													
	A	−.09	−.10	.14	**.67**	.17	.27	−.03	.04												
	C	−.11	−.16	−.27	.16	**.73**	.22	−.02	.22	.34											
BFQ	ES	**−.69**	.09	−.09	.20	.25	**.71**	−.02	.30	.23	.12										
	En	−.23	**.54**	.25	−.31	.26	.17	**.46**	.57	−.29	−.06	.05									
	O	−.19	.30	**.68**	.01	.15	.17	.13	**.48**	.09	−.12	.12	.51								
	F	−.10	.41	.26	**.58**	.03	.15	.44	.05	**.48**	.02	.14	.16	.31							
	C	−.06	−.05	.12	−.06	**.64**	.11	−.10	.33	.13	**.54**	.09	.32	.34	.06						
CBFM	ES	**−.63**	.32	−.05	.22	.31	**.73**	.22	.37	.22	.17	**.69**	.19	.17	.25	.17					
	E	−.16	**.71**	−.01	−.01	.09	.08	**.78**	.30	−.21	−.03	−.12	**.55**	.15	.30	−.05	.19				
	I/O	−.26	.39	**.40**	.06	.32	.27	.28	**.48**	.13	.01	.13	.42	**.56**	.24	.25	.35	.35			
	A	−.04	.27	−.01	**.56**	.24	.11	.33	.04	**.53**	.28	.08	.03	.10	**.48**	.15	.35	.33	.42		
	C	−.18	.09	−.14	.11	**.76**	.26	.12	.34	.24	**.68**	.15	.18	.07	.12	**.61**	.38	.20	.33	.42	

Note: NEO-FFI = NEO Five-Factor Inventory, FFPI = Five Factor Personality Inventory, BFQ = Big Five Questionnaire, CBFM = Czech Big Five Markers, N = Neuroticism, ES = Emotional stability, E = Extraversion, En = Energy, O = Openness to Experience, I/O = Intellect/Openness to Experience, Au = Autonomy, A = Agreeableness, F = Friendliness, C = Conscientiousness. $N = 252$ subjects.

Table 6. Summary of the Model Fit.

Model	Description	Par.	*df*	χ^2	GFI	RMSEA
M1	Uncorrelated trait factors	40	170	1371.13	0.64	0.167
M2	Correlated trait factors	50	160	1288.73	0.65	0.167
M3	Correlated trait factors and correlated method factors	76	134	590.33	0.83	0.116

Note. Par. = number of parameters, GFI = goodness of fit index, RMSEA = root mean square error of approximation.

of the model fit from M1 to M2 is statistically significant (χ^2 = 82,4; *df* = 10; *p* = 0.000), but other reported overall fit indices (GFI = .83 and RMSEA = .116) do not indicate substantial improvement. Improvement of the model fit from M2 to M3 is considerable (χ^2 = 698,4; *df* = 26; *p* = 0.000). This result suggests the presence of method variance in the data. However, there is still the possibility of substantial improvement in model fit in Model 3 (GFI = .83 and RMSEA = .116). The sources of model misfit can be attributed to insufficient discriminant validity. Modification indices suggest some overlap of the Agreeableness and Extraversion scales and even Agreeableness and Conscientiousness scales of several methods (see the correlation matrix in Table 5).

More detailed results of the model M3 are given in Table 7, including standardized regression coefficients (factor loadings), residual variances of individual variables, intercorrelations of the latent variables (factors) and variances of latent variables. There are only two statistically non-significant regression weights (A from NEO-FFI on the NEO-FFI factor and Au from FFPI on O factor). All variances of latent variables are significant as are most of the intercorrelations of latent variables. Despite low internal consistency NEO-FFI Openness to Experience and Agreeableness factors are the strongest indicators of their respective factors. Low reliability does not necessarily compromise validity.

All signs of the regression weights are in agreement with orientation of the scale; in fact, only weights of the N from NEO-FFI are negative. This can be expected, because this scale is focused on Neuroticism as opposed to Emotional stability in the other three methods.

3.3 Discussion

Across all four instruments the scales with the lowest reliability were the NEO-FFI scales Agreeableness and Openness. A study by John and Srivastava (1999) that compared data from three instruments used for measurement of five personality dimensions in the United States (BFI, John, et al 1994; Trait Descriptive Adjectives, Goldberg 1992; and NEO-FFI, Costa & McCrae, 1992) found comparable results. The NEO-FFI scale Openness to Experience was least reliable, followed by the Agreeableness scale. Similar findings in another sample were published by Benet-Martínez and John (1998). The Openness to Experience and Agreeableness NEO-FFI scales tended to

Table 7. Detailed Results of the Model M3.

		Standardized Regression Coefficients									
		Trait					Method				Residual
Method	Scale	–N	E	O	A	C	NEO	FFPI	BFQ	CBFM	variance
NEO–FFI	N	–.63					–.54				16.02
	E		.68				.48				9.83
	O			.73			.43				13.18
	A				.89		.02				5.82
	C					.69	.63				6.65
FFPI	ES	.69						.60			2.02
	E		.83					.37			18.79
	Au			–.02				.87			22.55
	A				.77			.20			28.49
	C					.84		.36			19.62
BFQ	ES	.82							.38		35.22
	En		.32						.79		31.63
	O			.54					.73		25.43
	F				.70				.36		46.22
	C					.56			.61		45.11
CBFM	ES	.70								.58	13.58
	E		.76							.47	21.06
	I/O			.32						.74	15.63
	A				.67					.46	15.73
	C					.67				.62	16.17
		Correlations									Variance
	N										126.99
	E	–.11									11.40
	O	–.22	–.16								39.60
	A	.36	.17	.33							58.92
	C	.11	–.28	–.42	.30						44.70
	NEO–FFI										8.49
	FFPI						.89				69.15
	BFQ						.88	.75			72.81
	CBFM						.80	.73	.72		25.13

Note: NEO–FFI = NEO Five–Factor Inventory, FFPI = Five Factor Personality Inventory, BFQ = Big Five Questionnaire, CBFM = Czech Big Five Markers, N = Neuroticism, ES = Emotional stability, E = Extraversion, En = Energy, O = Openness to experience, I/O = Intellect/Openness to experience, Au = Autonomy, A = Agreeableness, F = Friendliness, C = Conscientiousness. $N = 252$ subjects.

be less reliable in the Polish and Slovak NEO-FFI versions (see Table 1). John and Srivastava (1999) suggested that items involving trying new and foreign foods and looking to religious authorities for decision on moral issues do not discriminate in adolescents as well as in Costa and McCrae's samples of older adults.

The lowest regression value was for Autonomy on the Openness trait factor, suggesting that this is not equivalent to other measures of that trait. Similar results were obtained by Perugini and Ercolani (1998) in an Italian version of the FFPI. They stated that Autonomy can be an additional alternative for the fifth factor so far labeled as Openness to Experience (Costa & McCrae, 1992), Intellect (Goldberg, 1992), Culture (Norman, 1963), or Creativity and Imagination (Saucier, 1992).

Correlations between method factors are all positive and high (from 0.89 to 0.72). This is caused, in our opinion, by the fact that the methods in fact do not really differ (questionnaires and self–rating scales). More interesting are correlations between individual trait factors (see Table 7). Seven of them are significant, suggesting that people who are emotionally stable score lower on Openness and higher on Agreeableness; that people with higher Extraversion ratings score higher on Agreeableness and lower on Conscientiousness; and that people who are open to experience tend to be agreeable but not conscientious. Finally, more agreeable people see themselves as more conscientious. In our opinion these findings need corroboration in further research.

Although we can conclude that the model M3 represents a description of data that is consistent with present knowledge, there is the possibility of further improvement of the model fit. Inspection of the residual covariances reveals that there are probably some other sources of variation in the data not accounted for by this model.

4. COMPARISONS OF CZECH, POLISH AND SLOVAK ADOLESCENTS

4.1. The Czech National Character

Opinions of historians, politicians, philosophers, and psychologists relating to Czech national character are contradictory, and therefore it is difficult to formulate hypotheses about levels of the five general personality dimensions in the case of Czechs. Paulus Stránský (1643/1840) collected ideas of his contemporary colleagues—historians who noted various faults among the Czech inhabitants: rapacity in wars, cruelty, inebriation. German writers asserted, according to Stránský, that Czech people are restless and quarrelsome by nature. These characteristics suggest a higher level of Neuroticism and lower level of Agreeableness. Contradictory opinions about the agreeableness of the Czech people can often be found in relevant literature. Stránský appreciates in Czechs their hospitality, magnanimity, and self-confidence. About Czech people it is said that they are of a dove-like nature, are mild, and yield rather than stand up to opposition. Avoiding conflicts is usual for people scoring high on Agreeableness. Masaryk (1895), the first president of Czechoslovakia, wrote one paper about the faults of the Czech character, in which he stressed rather its passivity, manifesting itself in the fact that Czechs believe in martyrdom and celebrate it. It is significant that the most brilliant pages of Czech history begin and end with martyrdom—Saint Wenceslas and John Huss. Moreover, Masaryk wrote about a special type of intrigue. "Since the intriguers

are unable to behave as lions, they become foxes. Since they can not act as heroes, they become lackeys and help themselves by servile cunning." They use manipulation of others to obtain some advantage that suggests low scores on Agreeableness. According to Hyhlík (1969), Czech people tend to be individualistic and appreciate privacy, and therefore a low score on Extraversion can be hypothesized. Their attitude to work includes characteristics like conscientiousness, responsibility, and pride of accomplishment, as well as a strong sense of duty; for those reasons we can expect higher scores on Conscientiousness. Hyhlík also presents a long list of traits that express intellectual capabilities, abilities, and talents. In his opinion Czech people are rational, industrious, active, inventive, and teachable, think logically, and have the ability of improvisation. In addition, Mahen (1924) considered playfulness as a typical feature of the Czech people. Sýkora (1939) mentioned the musical talent of the whole nation. We can expect higher score of Openness to Experience.

4.2. Polish Cultural Norms and Scripts

Although stereotypes regarding Poles are widespread and well known, little research has been done concerning Polish cultural norms and cultural scripts, which would be reflected in people's behavior. However, some of them have been identified and might be observable at the level of personality traits.

Although Poles are not as expressive as Russians or Brazilians, there is clearly a norm of spontaneity when it comes to expressing their own emotions. Wierzbicka (1994) suggested that in Polish culture "emotional spontaneity is valued more highly than a desire to make someone else feel good;" thus, it encourages the showing of good feelings toward the addressee as well as bad feelings. However, it seems that bad feelings are expressed more readily. Disagreement, disapproval, or irritation can be expressed quite openly, which might shock foreigners from more "agreeable" cultures. Poles would rather be seen as rude and aggressive than as agreeable and self-controlled. As Ronowicz (1995, p. 80) puts it: "an argument is not only considered a good way of exchanging ideas, but also an enjoyable form of conversation." There is also a cultural script for complaining. When two friends meet, they often start a conversation by discussing their own health problems. In a study by Dolinski (1997), Polish subjects usually define their moods as worse than usual, in contrast to American subjects, who always feel better than usual. This might also result in a relatively high level of reported Neuroticism.

The importance of the Roman Catholic Church in Polish history cannot be overestimated. This applies even in the 20th century, despite an almost universal trend to secularization. In Communist Poland, the Church was oppressed, but not under such strong control as in U.S.S.R. or in Czechoslovakia, and it became a strong force in people's struggle for freedom, especially after Karol Wojtyla became Pope John Paul II. At the individual level, the Catholic Church has advocated "family values." According to them, family life has to be more important than individual career. In Poland, marriage is often considered "ever-lasting," and it has one of the smallest divorce rates in Europe (19% in 1996; for the Czech Republic and Slovakia the figures are 61% and 34%, respectively). There is also strict condemnation of pre- and extra-

marital sex, contraceptives, and abortion. Generally, the Catholic Church advocates conservative values, which prescribe following traditional rules, suspicion of everything that is new or unknown, honoring elders, and showing respect to national history and cultural heritage. Little wonder that Polish subjects had one of the highest rates of conservatism in Schwartz's (1994) cross-cultural comparison. One might also expect relatively low scores in the case of Openness to Experience.

Boski et al. (1999) has listed the following elements of Polish culture that could be interpreted as a femininity syndrome: a) a cult of the Virgin Mary as the principal Catholic deity and a symbolic queen of Poland; b) women's high participation rate in the workforce; c) marginality of sexual crimes such as harassment and rape; and d) great diversity of diminutives in the spoken language, which personalize the human interaction and make it affectionate. In feminine cultures dominant values are caring for others and preservation: People work in order to live, not vice versa, preferring co-operation to competition; and in politics the welfare state is the ideal. The position of Poland among feminine societies has been confirmed by research of Hofstede (1998). He found that there is a strong modesty rule in Poland; thus Polish subjects, in contrast to American and Canadian ones, rated their skills "moderate" or "good," rather than "excellent." As Hofstede (1998, p. 85) put it: "In feminine countries, both boys and girls learn to be nonambitious and modest. Assertive behavior and attempts at excelling that are appreciated in masculine cultures are easily ridiculed in feminine ones. Excellence is something one keeps to oneself." And this is also true of success. Throughout post war times, material success in Poland has been associated with fraud and corruption, and the situation changes very slowly. This rule of modesty might also be evident in personality scores, especially if dimensions are evaluative (e.g. Conscientiousness).

4.3. On the Character of Slovaks

The politician Fishof (Mahen 1924) noted the following differences among Czech, Polish, and Slovak people. The Czech people are, in his opinion, ambitious, consistent, enthusiastic, but bitter. Polish people are dreamers, hot-blooded and proud. They do not spare time, money, or blood. Slovaks are, in Fishof's opinion, self-confident and short-tempered. Jurovský (1943) supposed that Slovaks are able to experience more emotions in comparison with members of other nations; they are more emotional and excitable; and they easily change from one emotion to another, although they are able to control themselves. Slovaks are characterized by sanguine temperament, cohering with impulsiveness, generosity, flexibility, and the capacity to be enthusiastic about something new (Stavěl, 1982). Thus, lower scores on Neuroticism and higher levels of Extraversion and Openness to Experience can be hypothesized. No relevant references were found on which to base hypotheses about levels of Agreeableness and Conscientiousness.

4.4. An Empirical Study

On the basis of relevant literature, the following hypotheses were formulated. We expected that Czechs would reach higher scores on Openness and Conscientiousness, Polish people higher on Neuroticism, and Slovaks higher on Extraversion, in comparison with the other two countries. Our third study was directed at a comparison of Czech, Polish, and Slovak adolescents on the five personality dimensions measured by the NEO-FFI. We expected some differences between individual nations and between boys and girls but no interaction of gender and nation.

The sample consists of 1,538 adolescents (age 14-23, M = 16.95, SD = 1.8), including 279 boys and 400 girls from the Czech Republic, 157 boys and 193 girls from Poland, and 209 boys and 300 girls from Slovakia. Members of each national sample completed a NEO-FFI translated into their native language.

The analysis conducted was MANOVA with the vector of Big Five scales as set of dependent variables and nation and gender as fixed factors (in our opinion the sample is not so unbalanced that dummy variable contrast coding is needed).

4.5. Results

To make scores more easily interpretable, all mean values were converted to T-scores (which have a mean of 50 and standard deviation of 10 in the normative group), using American norms for college-age men and women (Costa & McCrae, 1992). Differences

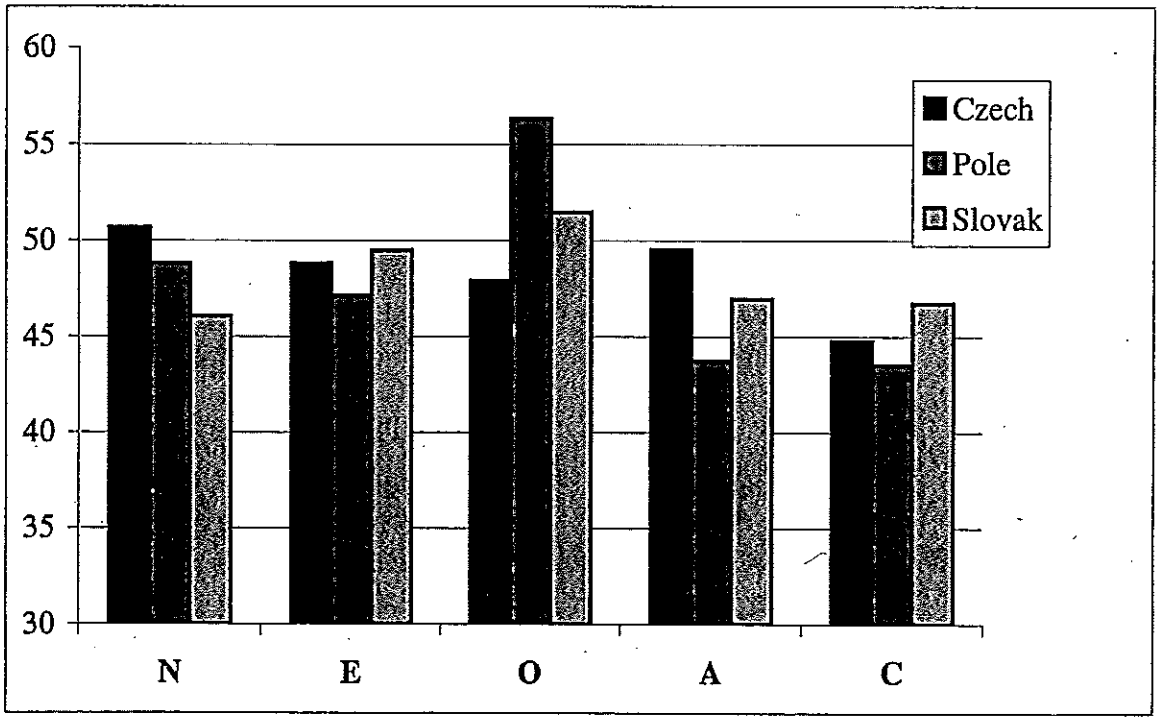

Figure 1. Differences among Czech, Polish, and Slovak adolescents on NEO-FFI scales. Mean T*-scores were computed within each culture using means and standard deviation from the American normative college age sample. N = Neuroticism, E = Extraversion, O = Openness to Experience, A = Agreeableness, C = Conscientiousness.*

Table 8. Summary of the Post Hoc Comparisons.

	Czech					Polish					Slovak				
Czech	N	E	O	A	C	**N**	E	O	**A**		**N**	E	O	A	C
Polish	N	E	**O**	A	C	N	E	O	A	C	**N**	E	**O**	A	C
Slovak	N	E	**O**	A	**C**	N	**E**	O	**A**	**C**	N	E	O	A	C

between the nations on the Big Five scales are plotted in Figure 1. The greatest differences can be seen in the self-reports concerning Openness to Experience and Neuroticism. Czech adolescents describe themselves as most neurotic (followed by Poles and Slovaks) and least open (followed by Slovaks and Poles who describe themselves as most open). Compared to American college-age respondents, most scores are in the average range. The most striking findings are the uniformly low levels of Conscientiousness (compared to the U.S.) and the variation in Openness to Experience among cultures.

Further analysis assessed the statistical significance of these differences. The results showed significant differences between boys and girls on all personality traits with the exception of Conscientiousness. Girls reported higher Neuroticism, Extraversion, Openness, and Agreeableness than boys. These differences are consistent with findings using German data (Borkenau & Ostendorf, 1993).

MANOVA with NEO-FFI scales as dependent variables and country and gender as fixed factors (and their interaction) showed significant differences in the profiles of the NEO-FFI scales for individual countries (Wilks' lambda = 0.817, $p = 0.000$) and gender (Wilks' lambda = 0.877, $p = 0.000$). Their interaction was not statistically significant. Differences among countries are statistically significant on all scales, and the same holds true in the case of gender (with the exception of Conscientiousness scale).

In order to carry out a fine-grained discussion of the national differences, we performed post hoc comparisons (with Bonferroni correction) of individual countries on each NEO-FFI scale. The results are summarized in the Table 8. Boldface entries in individual cells mean that subjects from the nation in the corresponding row rate themselves higher on the particular NEO-FFI scale than subjects from the country in the corresponding column (e.g. Czech adolescents rate themselves as more neurotic then Poles and Slovaks and more agreeable than Poles).

4.6. Discussion

From the MANOVA results it follows that there are significant differences in the national self-ratings among Czech, Polish, and Slovak adolescents. The most extreme self-ratings were shown by Slovak adolescents—they are more emotionally stable, extroverted, and conscientious than Czech and Polish adolescents. Only one hypothesis was confirmed, namely, that Slovaks would achieve a higher score on Extraversion in comparison with adolescents from the other countries. The basic assumption that Polish people would achieve lower scores on the Openness scale was not confirmed; on the contrary, Polish adolescents rated themselves as most open in comparison with Czechs

and Slovaks. The hypothesis of a high score of Neuroticism in the Polish sample was also not confirmed; Czech adolescents rated themselves as most neurotic. Further, we expected that Czech adolescents would rate themselves as more conscientious in comparison with Polish and Slovak adolescents, but Slovak adolescents rated themselves as the most conscientious. Evaluations of various nationalities, which were provided by psychologists, historians, philosophers, and politicians seem to differ significantly from how members of these nations rated themselves.

Hřebíčková, Macek, and Ostendorf (2000) compared Czech and German adolescents on the NEO-FFI scales and found that Czech adolescents reported significantly higher Neuroticism, Extraversion, and Conscientiousness, and lower Openness to Experience, when compared to the German sample. Possible explanations of the cross-cultural differences include non-equivalent translations of the instruments.

5. SUMMARY

The principal aims of this study were to investigate the validity and applicability of the NEO Five-Factor Inventory across three countries and languages, to compare four different instruments proposed to measure the five-factor structure, and to compare mean levels of personality traits in Czech, Polish, and Slovak adolescents.

The results in the first study give an overall impression of the psychometric qualities of the NEO-FFI in Czech, Polish, and Slovak contexts. It was corroborated that the same traits were measured by the instrument when it was translated into other languages and administered to subjects from cultures different from the one in which it was originally developed. For four scales, results strongly supported the reliability of the NEO-FFI in these three West Slavic languages. The Openness scale demonstrated lower reliability. This result is probably not greatly affected by cultural or language differences. As noted by John and Srivastava (1999), some items from the Openness scale do not discriminate well in an adolescent sample. Our results and the results reported by Parker and Stumpf (1998) support this statement. The comparison of factor patterns by means of congruence coefficients showed that the structures in the three Slavonic languages converge to a lesser degree than the structures in American English and German.

The Five-Factor Model has been conceptualized as an orthogonal factor model (Borkenau & Ostendorf, 1993). However, the consistent pattern of nonzero correlations among the domain scales seems to imply the possibility of an oblique factor structure in the FFM. Caprara, Barbaranelli, Bermudez, and Maslach (2001) revealed non-negligible cross loadings in Italian, Spanish, and American versions of the BFQ. We determined that this is not a problem of a specific instrument such as BFQ, because the same findings apply in the cases of the NEO-FFI, FFPI, and CBFM.

Across all five factors and all instruments, convergent validity is satisfactory. Although the mean convergence validity correlation was only .60, the correlation values are attenuated due to the unreliability of the scales. Overall, mean discriminant correlations were low, although some correlations were higher than they should have been. The parameters estimated for Model 3 suggest three major conclusions. First, all scales except one (Autonomy from FFPI) have substantial loadings on the relevant

latent variables, with an average loading of .64, suggesting that all four measures generally tap the same five dimensions. Second, there are significant loadings on the method factors that are strongly correlated, suggesting that the methods are rather similar. Third, however, there is still variation not accounted for by this model.

We assumed that people from these three countries who speak similar languages and live in similar cultural conditions would not differ in the level of personality traits. Our results showed otherwise: Among Czech, Slovak, and Polish adolescents there are statistically significant differences. Slovak adolescents provide the most extreme self-ratings—they are more emotionally stable, extroverted, and conscientious then Czech and Polish adolescents. Polish adolescents describe themselves as more open in comparison with Czech and Slovak adolescents.

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