GENDER DIFFERENCES IN VOCATIONAL INTERESTS ACROSS THREE BALKAN COUNTRIES

UDC 331.54-055(497.11+497.2+497.7)

Vladimir Hedrih

University of Niš, Faculty of Philosophy, Department of Psychology, Serbia

Abstract. *The main objective of the study was to examine gender differences in vocational interests across three neighboring Balkan countries – Bulgaria, North Macedonia, and Serbia. Vocational interests were operationalized through the spherical model of vocational interests and Holland's RIASEC circumplex model. The study reanalyzed data from previously published studies that collected vocational interest data from these countries. Participants of the study were 2536 young people, bachelor students in case of Bulgaria and North Macedonia and young people, with a high proportion of students, in the case of Serbia. They completed the Personal Globe Inventory. The results showed large gender differences along the People-Things dimension with Cohen's d values ranging between 1.34 and 1.5 in the three country subsamples. Males tended to have higher preferences for jobs and activities that involved working with things than females, while females tended to have higher preferences for jobs and activities involving working with people than males. A substantial difference, but of smaller magnitude, was found in all three countries on the vocational interest dimension of Prestige, with females having higher scores than men. This difference came partly from higher preferences of women for high prestige jobs compared to men, but to a much greater extent from a much lower preference of women for low prestige jobs and activities compared to men. Comparisons were also made on vocational interest types and the largest differences found corresponded to those found in other world countries.*

Key words: *vocational interests, spherical model of vocational interests, gender differences, Serbia, Bulgaria, North Macedonia.*

1. INTRODUCTION

1.1. Vocational interests

Vocational interests are usually defined as preferences for various career choices, professions or activities, and behaviors. Individuals tend to like doing things that are in line with their vocational interests and to much less like or dislike things that are not.

One of the most influential concepts of vocational interests was proposed in the mid-20th century by John Holland (Hogan & Blake 1999; Holland 1959, 1994). Holland proposed that vocational interests can be grouped into six types that he initially named the motoric, intellectual, supportive, conforming, persuasive, and esthetic orientation. He proposed that these correspond to six distinct types of work environments with the same name, all of which he derived from major occupational groups at the time, and contemporary studies on occupations. These were later renamed and are now known as realistic (R), investigative (I), artistic (A), social (S), entrepreneurial (E) and conventional (C). Holland proposed that they form a hexagon in two-dimensional space, and this was later reinterpreted as a circumplex (Browne 1992; Tracey & Rounds 1992), a circular statistical structure where variables are grouped in a circle, with variables next to each other being in the highest positive correlations, those a bit further away are in lower correlations, while those on opposite sides of the circle are in the lowest correlations or their correlations are negative. These became known as Holland's RIASEC types (e.g. Nauta 2010)

Since then multiple other researchers have given notable contributions to the study of vocational interests using different theoretical approaches (Savickas 1985; Smart & Peterson 1997; Tracey & Rounds 1994) and by identifying developmental stages of interest development (Super, 1980). However, when it comes to systematizing individual differences in vocational interests, Holland's theory and those developed from it reigned supreme.

The validity of the propositions of Holland's theory have been tested in many world countries and most of the results have supported the circumplexial ordering of vocational interest types, although not uniformly so (e.g. Glidden-Tracey & Parraga 1996; Hedrih 2008; Hedrih et al. 2016, 2018; Hedrih et al. 2007; Iliescu et al. 2013; Long et al. 2005; Long & Tracey 2006; Associate & Hedrih 2010; Tak 2004; Vardarlı et al. 2017).

Since its conception, Holland's theory saw many further developments. Dale J. Prediger proposed that the 6 types exist in a two-dimensional space defined by people-things and ideas-data dimensions (Prediger 1982). The people-things dimensions "is placed so that it passes through the positions of R and S types on the hexagon. It defines the preference for working with people that is opposed to the preference for working with things. The second dimension stands orthogonal to the first dimension and passes between I and A types on one side of the hexagon and C and E types on the other side. It defines the preference for working with ideas as opposed to the preference for working with data" (Hedrih et al. 2018, 20). Subsequent authors have proposed different orientations of these dimensions (Rounds & Tracey 1993), but at the moment this paper is being written, Prediger's proposal remains the most widely used. While dimensions represent a simpler structure than types, many researchers and practitioners have found types to be more convenient for practical applications and they remain in use today.

Noting that Holland's six RIASEC types are arbitrary ways of organizing the vocational interest space into types (Tracey & Rounds 1995), but that they also group together vocations requiring different skill levels and with different associated prestige levels without taking effort to balance the six types on these important variables, Tracey

and Rounds proposed a new more comprehensive vocational interest model that included the two-dimensional vocational interest spaces covered by Holland's hexagon, but added a third dimensions of prestige (Tracey & Rounds 1996). Studies demonstrated that preferences and self-assessed competencies for various activities and preferences for vocations roughly form a sphere in this latent space (Sodano 2011; Sodano & Tracey 2008; Tracey et al. 1997). The plane within this model that contains Holland's RIASEC types and that is defined by Prediger's dimensions (Prediger 1982) was referred to as Holland's plane or Holland's equator (Hedrih 2008; Hedrih et al. 2018). Given the arbitrary nature the vocational interest types and the fact that they indeed have their practical use, Tracey and Rounds proposed a new set of 18 types to divide the vocational interest three-dimensional space, i.e. the vocational interest sphere into. Eight of these types cover Holland's equator and correspond in a more systematic way to the latent dimensions underlying the plane of people-things and ideas-data, than the RISACE types. Four of the types are located above Holland's equator, representing vocations and activities of higher prestige. Four are immediately below the equator, representing lower prestige activities and vocations. Finally, there is one vocational interest type at the top of the sphere (influence), representing the highest prestige jobs and activities, and one at the bottom of the sphere representing activities/vocations that include the lowest level of prestige.

An interesting thing to note is that all three dimensions of vocational interest space can be extracted from vocational interest inventories constructed to measure RIASEC and spherical model types using exploratory factor analysis. However, when performing this analysis, an additional factor is always extracted as the first factor, with the highest eigenvalue and with substantial loadings on all test items. This factor is known as the general factor of vocational interests. While it is not considered a dimension of vocational interests and is not included in any of the dimensional models of vocational interests stemming from Holland's tradition, it has attracted a lot of research interest, with some researchers considering it to represent interest flexibility and uncovering its various features (Darcy & Tracey 2003; Hedrih et al. 2016; Hedrih & Associate 2007; Šverko & Babarović 2016).

Assumptions of the spherical model of vocational interests, i.e. its validity have been tested in many different world countries. The results have mostly been supportive of the model (e.g. Darcy 2005; Etzel et al. 2016; Hedrih 2008, 2011; Hedrih et al. 2016, 2018; Long et al. 2005; Šverko 2008; Associate & Hedrih 2010; Tracey et al. 1997). Interest inventories that assess vocational interests in accordance with the spherical model can also make assessments of Holland's RIASEC types. This is made possible by the fact that the RIASEC plane is included in the spherical model latent space, representing two of its three dimensions. Due to this, research studies testing the spherical model in different countries and cultures have often also tested the validity of Holland's circumplex. Interestingly, the result often showed that assumptions of the RIASEC circumplex, i.e. the assumption that the RIASEC types will form a circumplex in two dimensions, have often been found to fit the data better than the spherical model itself and even better than was found using the older tests created specifically to measure Holland's hexagon. It is likely that this is due to the fact that RIASEC measures of the spherical model-based inventories are balanced for prestige, i.e. RIASEC measures from these inventories are solely calculated from items about medium prestige activities, while this balance is absent in inventories solely based on Holland's theory.

1.2. Gender differences

Aside from testing assumptions of the vocational interest theory, both Holland's circumplex and the spherical model, researchers have studied relationships with other psychological constructs. Likely one of the most studied are relationships with personality. This is at least in part due to the fact that John Holland himself in some of his works referred to his types as personality types. Studies have confirmed stable and sometimes quite substantial associations between vocational interests and personality, but also that vocational interests cannot be reduced to personality traits, at least not to the basic personality traits (Hedrih 2009; Hogan & Blake 1999; Larson et al. 2002; McKay & Tokar 2012; Šverko & Babarović 2016; Tokar & Fischer 1998).

Many studies have also focused on gender differences in vocational interests. While there is an intensive ongoing debate in our society about gender equality and its bearing on disproportionate shares of people of different gender in different vocational areas, the origins of these disproportions remain under dispute. What remains as a fact is that gender is associated with career choice i.e., genders are not equally represented in different vocations (for example, Farmer et al. 1998). Historically and even today, many societies have divided activities and vocations into male and female (Hedrih 2020) and this cultural tendency is described by Hofstede's cultural dimension of masculinity-femininity (Hofstede 2011; Hofstede et al. 1990).

Gender differences in vocational interest have been studied extensively and in a number of countries. A meta-analysis by Su, Rounds and Armstrong of studies published in English and on samples from US and Canada reported a very strong difference between males and females on the people-things dimensions, with males having substantially stronger preferences for working with things and women for working with people. The study also found a considerably higher interest of males for engineering professions than was the case for women (Su et al. 2009). In the Balkans area, a study by Šverko reported on gender differences in vocational interests operationalized by the spherical model across three age cohorts in Croatia – senior primary school pupils, secondary school students, and university students (Šverko 2008). Her study reported gender differences on almost all types of vocational interests across all three age cohorts. The differences on vocational interest types near the poles of the people-things axis were in the expected direction.

2. THE METHOD

2.1. The current study

The goal of the current study is to examine gender differences in types of vocational interests proposed by the spherical model in a sample from three neighboring Balkan countries – Bulgaria, North Macedonia, and Serbia.

A search of the literature conducted in the scope of this study did not find studies published in the English language reporting on gender differences in vocational interests on samples from these three countries. Providing such data would be the contribution of the current study to the scientific inquiry into vocational interests and how they are associated with gender. Additionally, studies on vocational interest on the Bulgarian and North Macedonian population are comparatively scarce, so this would also be a contribution to the internationally available literature on the psychological properties of these populations.

For this reason, data from two previously published studies of the author that collected data on vocational interests in these three Balkan states were reanalyzed to explore gender differences in vocational interests. The data was from studies of Hedrih et al. (2016) and Hedrih et al. (2018).

Based on previous studies, the expectation was that the results will show pronounced gender differences in vocational interests with the strongest difference being in types along the People-Things axis and with males scoring higher on working with things and females scoring higher on working with people.

2.2. The sample

The sample consists of a total of 2536 respondents from the three countries from the two studies mentioned above. Of these, 693 are from Bulgaria, 779 from North Macedonia, and 1064 from Serbia. Almost all of the respondents were below 30 years of age. Participants from Bulgaria and North Macedonia were all students of social sciences and humanities, while the Serbian sample consisted of young people in general, with a high proportion of students. In the Bulgarian sample 27.4% of the respondents were female. In the North Macedonian sample it was 23.5% and in the Serbian sample 44.7%. While there is a significant gender disproportion both in the Bulgarian and the North Macedonian sample, the number of males and females in each sample are sufficient for the planned analyses.

2.3. Instruments

Data were collected using the Bulgarian, North Macedonian, and Serbian version of the Personal Glove Inventory (Tracey 2002). The respective language versions were created using the backtranslation procedure (Hedrih 2020).

The PGI inventory of vocational interests consists of 324 items representing various measures of vocational interests proposed by the model.

The first 108 items represent various activities. The respondent is required to answer questions about each item – to assess his/her own preference for the activity described in the item and to also assess his/her own competency for conducting the described activity. The other 108 items represent occupations, and the respondent is required to specify their preferences for each of them.

The respondent gives responses to all items by using a seven-point scale (1-Strongly dislike, unable to do to 7 - Strongly like, Very competent).

The activity ends with a group of holistic self-assessment measures of preferences for global types of activities (working with people, things, ideas, data and for prestige).

The Personal Globe Inventory produces both measures of Holland's RIASEC types of vocational interests and of the 18 types of vocational interests proposed by the spherical model. Types of vocational interests measured by PGI are listed in table 1.

Table 1 Vocational interest types produced by the PGI

Tracey's 18 types of vocational interests according to the spherical model	
1. Social Facilitating	10. Influence
2. Managing	11. Business Systems
3. Business Detail	12. Financial Analysis
4. Data Processing	13. Science
5. Mechanical	14. Quality Control
6. Nature/Outdoors	15. Manual Work
7. Artistic	16. Personal Services
8. Helping	17. Construction/Repair
9. Social Sciences	18. Basic Service
Holland's six types of vocational interests	
1. R – Realistic	4. S – Social
2. I – Investigative	5. E – Enterprising
3. A - Artistic	6. C - Conventional

Table adapted from Hedrih et al. 2018.

2.4. The procedure

This study reanalyzes the data from studies Hedrih et al. 2016 and Hedrih et al 2018. The data were collected between 2007 and 2013. In Bulgaria and North Macedonia, students of the Sofia University "St. Kliment Ohridski" (Bulgaria) and University of Skopje (North Macedonia) were asked to complete the PGI during their regular classes. This was done in cooperation with the teachers and the faculty management. While the students filled in the PGI at least one member of the research team was present, along with the professor or the assistant during whose class the data collection was conducted. Data for the Serbian sample were collected using a variety of methods including an online survey, asking students to complete the test during their classes, having respondents complete the survey in their homes and asking psychology students of the University of Niš have their relatives and acquaintances complete the paper and pencil version of the test.

2.5. The analyses

The gender groups within each subsample were compared using the t-test for independent samples. Cohen's d statistics were calculated as measures of effect size. Cohen's d values of .2 were considered small, d values of .5 were considered medium, and Cohen's d values of .8 and above were considered large (Cohen 1988; Hedrih & Hedrih 2022). To compare sizes of differences on vocational interests in general across different samples, average values of Cohen's d size were calculated by dividing the sum of absolute values of Cohen's d statistics for all vocational interests tested with the number of vocational interest measures. This was done for all vocational interest measures on which gender means were compared on each of the national samples.

3. RESULTS

To compare genders on their scores of vocational interests, t tests and Cohen's d statistics were calculated for each national (sub)sample separately.

Table 2 Gender differences in vocational interests for the North Macedonian sample

	North Macedonian sample					
	Spherical model types	Gender	Mean	SD	t	Sig.	Cohen's d
1	Social Facilitating	Male Female	3.58 4.15	1.08 1.05	-6.14	**<.01**	**-.54**
2	Managing	Male Female	3.86 3.72	1.11 1.11	1.39	.16	.12
3	Business Detail	Male Female	3.45 3.27	1.31 1.41	1.43	.15	.13
4	Data Processing	Male Female	3.38 2.54	1.25 1.31	7.33	**<.01**	**.65**
5	Mechanical	Male Female	2.87 2.12	1.17 .89	8.82	**<.01**	**.78**
6	Nature/Outdoors	Male Female	3.28 3.23	1.16 1.16	.47	.64	.04
7	Artistic	Male Female	3.03 3.71	1.45 1.54	-5.06	**<.01**	**-.45**
8	Helping	Male Female	4.03 5.14	1.13 1.10	-11.45	**<.01**	**-1.00**
9	Social Sciences	Male Female	3.61 4.72	1.46 1.48	-8.47	**<.01**	**-.75**
10	Influence	Male Female	3.71 3.76	1.28 1.20	-.43	.67	.04
11	Business Systems	Male Female	3.51 3.01	1.21 1.26	4.48	**<.01**	**.40**
12	Financial Analysis	Male Female	3.19 2.92	1.38 2.31	1.40	.16	.13
13	Science	Male Female	3.37 3.38	1.33 1.32	-.06	.95	-.01
14	Quality Control	Male Female	2.78 2.13	1.06 .86	8.05	**<.01**	**.72**
15	Manual Work	Male Female	2.54 1.67	1.20 .76	11.12	**<.01**	**.99**
16	Personal Services	Male Female	2.51 3.15	.89 1.08	-.689	**<.01**	**-.61**
17	Construction/Repair	Male Female	2.43 1.52	1.23 .67	12.26	**<.01**	**1.09**
18	Basic Service	Male Female	2.58 2.69	.99 .92	-1.34	.18	-.12
	Holland's types	Gender	Mean	SD	t	Sig.	Cohen's d
1	Realistic	Male Female	2.87 2.12	1.17 .89	8.82	**<.01**	**.78**
2	Investigative	Male Female	3.28 3.23	1.16 1.16	.47	.64	.04
3	Artistic	Male Female	3.03 3.71	1.45 1.54	-.51	**<.01**	**-.45**
4	Social	Male Female	3.88 4.81	1.02 .99	-10.6	**<.01**	**-.94**
5	Entrepreneurial	Male Female	3.76 3.87	1.04 1.01	-1.13	.26	-.10
6	Conventional	Male Female	3.40 2.78	1.11 1.14	6.10	**<.01**	**.54**
	Latent dimensions	Gender	Mean	SD	t	Sig.	Cohen's d
1	People-Things	Male Female	1.32 4.63	2.64 2.42	-15.18	**<.01**	**-1.34**
2	Ideas-Data	Male Female	-.93 .19	3.00 3.26	-3.94	**<.01**	**-.35**
3	Prestige	Male Female	2.30 3.70	2.48 2.21	-6.86	**<.01**	**-.61**

Note: The mean value of Cohen's d size for the North Macedonian sample for all types is .51.

Table 3 Gender differences in vocational interests on the Bulgarian sample

	Bulgarian sample					
	Spherical model types	Gender	Mean	SD	t	Sig.	Cohen's d
1	Social Facilitating	Male Female	3.33 4.16	1.02 .97	-9.61	**<.01**	**-.84**
2	Managing	Male Female	4.04 4.25	1.16 1.09	-2.17	**.03**	**-.19**
3	Business Detail	Male Female	3.30 3.14	1.23 1.28	1.46	.15	.13
4	Data Processing	Male Female	2.95 2.12	1.14 .88	9.93	**<.01**	**.87**
5	Mechanical	Male Female	2.79 1.81	1.21 .85	11.71	**<.01**	**1.02**
6	Nature/Outdoors	Male Female	3.39 3.19	1.20 1.15	2.04	**.04**	**.18**
7	Artistic	Male Female	3.40 3.76	1.51 1.48	-2.73	**<.01**	**-.24**
8	Helping	Male Female	3.80 4.62	1.14 1.08	-8.66	**<.01**	**-.75**
9	Social Sciences	Male Female	3.55 4.37	1.36 1.33	-7.08	**<.01**	**-.62**
10	Influence	Male Female	3.71 3.86	1.20 1.07	-1.53	.13	-.13
11	Business Systems	Male Female	3.23 2.82	1.25 1.27	3.78	**<.01**	**.33**
12	Financial Analysis	Male Female	3.20 2.94	1.26 1.37	2.30	.20	.20
13	Science	Male Female	3.36 3.05	1.28 1.25	2.80	**<.01**	**.24**
14	Quality Control	Male Female	2.80 2.17	1.17 .79	7.93	**<.01**	**.69**
15	Manual Work	Male Female	2.59 1.69	1.27 .76	11.14	**<.01**	**.97**
16	Personal Services	Male Female	2.54 3.25	1.02 1.06	-7.72	**<.01**	**-.67**
17	Construction/Repair	Male Female	2.60 1.57	1.24 .70	13.36	**<.01**	**1.17**
18	Basic Service	Male Female	2.81 2.99	1.10 .93	-2.11	**.03**	**-.18**
	Holland's types	Gender	Mean	SD	t	Sig.	Cohen's d
1	Realistic	Male Female	2.79 1.81	1.21 .85	11.71	**<.01**	**1.02**
2	Investigative	Male Female	3.39 3.19	1.20 1.15	.204	**.04**	**.18**
3	Artistic	Male Female	3.40 3.76	1.51 1.48	-2.76	**<.01**	**-.24**
4	Social	Male Female	3.64 4.47	1.03 .94	-9.82	**<.01**	**-.86**
5	Entrepreneurial	Male Female	3.79 4.22	1.01 .96	-.50	**<.01**	**-.44**
6	Conventional	Male Female	3.06 2.46	1.05 .92	7.23	**<.01**	**.63**
	Latent dimensions	Gender	Mean	SD	t	Sig.	Cohen's d
1	People-Things	Male Female	1.58 5.13	2.36 2.39	-17.08	**<.01**	**-1.50**
2	Ideas-Data	Male Female	-.36 -.35	3.00 3.43	-.04	.97	-.03
3	Prestige	Male Female	2.03 3.30	2.50 2.08	-6.60	**<.01**	**-.58**

Note: The mean value of Cohen's d size for the Bulgarian sample for all types is .55.

Table 4 Gender differences in vocational interests on the Serbian sample

	Serbian sample					
	Spherical model types	Gender	Mean	SD	t	Sig.	Cohen's d
1	Social Facilitating	Male Female	3.41 4.10	1.05 0.99	-11.00	**<.01**	**-.68**
2	Managing	Male Female	3.86 3.93	1.16 1.13	-1.02	.31	-.06
3	Business Detail	Male Female	3.41 3.42	1.34 1.45	-.13	.89	-.01
4	Data Processing	Male Female	3.51 2.52	1.35 1.08	13.18	**<.01**	**.81**
5	Mechanical	Male Female	3.32 2.28	1.29 0.99	14.78	**<.01**	**.91**
6	Nature/Outdoors	Male Female	3.53 3.54	1.17 1.24	-.08	.94	-.01
7	Artistic	Male Female	3.13 3.90	1.48 1.53	-8.29	**<.01**	**-.51**
8	Helping	Male Female	3.79 4.96	1.14 1.09	-17.01	**<.01**	**-1.05**
9	Social Sciences	Male Female	3.34 4.43	1.29 1.44	-12.87	**<.01**	**-.79**
10	Influence	Male Female	3.58 3.90	1.17 1.20	-4.39	**<.01**	**-.27**
11	Business Systems	Male Female	3.65 3.31	1.34 1.31	4.21	**<.01**	**.26**
12	Financial Analysis	Male Female	3.47 3.38	1.49 1.52	.97	.33	.06
13	Science	Male Female	3.50 3.95	1.35 1.37	-5.33	**<.01**	**-.33**
14	Quality Control	Male Female	3.20 2.56	1.12 1.00	9.86	**<.01**	**.61**
15	Manual Work	Male Female	2.97 1.96	1.17 0.99	15.21	**<.01**	**.94**
16	Personal Services	Male Female	2.65 3.23	1.02 1.03	-9.22	**<.01**	**-.57**
17	Construction/Repair	Male Female	2.80 1.65	1.19 0.86	18.15	**<.01**	**1.12**
18	Basic Service	Male Female	2.79 2.95	1.04 0.98	-2.51	**<.01**	**-.16**
	Holland's types	Gender	Mean	SD	t	Sig.	Cohen's d
1	Realistic	Male Female	3.32 2.28	1.29 0.99	14.78	**<.01**	**.91**
2	Investigative	Male Female	3.53 3.54	1.17 1.24	-.08	.94	-.01
3	Artistic	Male Female	3.13 3.90	1.48 1.53	-8.29	**<.01**	**-.51**
4	Social	Male Female	3.66 4.67	1.00 0.95	-16.82	**<.01**	**-1.04**
5	Entrepreneurial	Male Female	3.71 3.99	1.06 1.01	-4.37	**<.01**	**-.27**
6	Conventional	Male Female	3.47 2.82	1.13 1.05	9.71	**<.01**	**.60**
	Latent dimensions	Gender	Mean	SD	t	Sig.	Cohen's d
1	People-Things	Male Female	0.36 4.26	2.87 2.41	-24.08	**<.01**	**-1.49**
2	Ideas-Data	Male Female	-0.49 0.32	3.39 3.57	-3.74	**<.01**	**-.23**
3	Prestige	Male Female	1.51 3.61	2.61 2.35	-13.75	**<.01**	**-.85**

Note: The mean value of Cohen's d size for the Serbian sample for all types is .54.

The results show that the largest differences between males and females from North Macedonia are for the Construction/Repair, Manual Work, Helping, Mechanical, Social Sciences and Quality Control types of the spherical model, on the Social and Realistic types of the RIASEC model. Females had higher scores on all three dimensions, the largest by far being the one on People-Things, followed by Prestige. Most of the listed differences are large in size. The size of the average difference in vocational interest measures on the North Macedonian sample is medium, even when taking into account the measures where differences were not statistically significant.

The largest differences on the Bulgarian sample were for the Construction/Repair, Mechanical, Manual Work, Social Facilitating, Data Processing and Helping types of the spherical model, on the Realistic and Social types of the RIASEC mode. Females had higher scores than males on People-Things and Prestige dimensions with the former being extremely large and the latter being of medium size.

The largest differences on the Serbian sample were for the Construction/Repair, Helping, Manual Work, Mechanical, Data Processing and Social Sciences types of the spherical model, on the Social and Realistic types of the RIASEC mode. Females had higher scores than males on all three prestige dimensions, with the difference on the People-Things dimension being extreme, on the Prestige dimensions large, but not extremely so, and on the Ideas-Data dimension being relatively small.

When looking at Cohen's d sizes across all considered vocational interest measures, including the ones where there are no differences between mean values, it can be seen that the average Cohen's d size ranges between .51 for the North Macedonian samples and .55 for the Bulgarian sample, and that it indicates a medium size difference as the average, when all the measures are taken into account, regardless of whether a gender difference was statistically significant in it or not.

When correlations between sets of Cohen's d statistics obtained from the three samples are calculated, they range between .94 and .97, indicating that the structures of the differences and their sizes are very similar, across the three compared samples.

4. DISCUSSION

The main hypothesis of the study was confirmed. In all three samples, the most pronounced difference in the dimensions of vocational interests was on the People-Things dimensions. As expected, and given that this particular measure is oriented towards working with people, i.e. higher scores mean higher preferences for working with people, females had much higher average scores than males. In all three samples, Cohen's d statistics for differences in people-things were well-above 1, and thus substantially larger than the difference size reported in the meta-analysis of Su et al. 2009.

When looking at the average d value, it can be noticed that these were somewhat higher than the .45 average Cohen's d value reported in the mentioned meta-analysis.

Looking at the remaining differences in vocational interest dimensions, it can be noticed that statistically significant gender differences were obtained on the Prestige dimension and these ranged from moderate in size in Bulgaria and North Macedonia to high, in Serbia. Analyzing how the measure of this dimension is constructed, it can be concluded that the origin of this difference comes primarily from gender differences in the lower prestige hemisphere of the spherical model. When looking at the higher prestige

vocational types it can be seen that there are low to moderate gender differences on some of those types. The highest difference, present in all three samples, on the upper prestige hemisphere is on the Social Sciences type. This difference is moderate to high in favor of females. A number of other differences were obtained on the upper hemisphere types, but these were all of lower magnitudes and some indicated higher scores for men, some for women. On the other hand, the strongest obtained differences between types are located on the lower hemisphere and they describe striking gender differences in preferences for manual work, the type at the lower pole of the prestige dimension, and Construction/Repair. Although both genders tended to score lower on these two types when compared to their average scores on other types, scores of women were much, much lower than those of men. The fact that, of the lower prestige types, women scored somewhat higher on Personal Services did not offset the large differences on these two types much.

Considering the Ideas-Data dimension, in two of these three samples, a low to moderate difference was obtained in favor of women i.e., women were found to prefer working with ideas slightly more than men, who preferred working with data. This runs counter to the findings from the mentioned meta-analysis that reported a Cohen's d of .10 indicating females having a slightly higher average preferences for data (vs. men for ideas).

When comparing the results of a comparison of genders on spherical interest types to previous findings, the stronger preferences of women for Helping and Social Facilitating types and of men for Mechanical and Data processing previously reported in studies in Germany (Etzel et al. 2016) and Croatia (Šverko 2008) have been reproduced on all three samples. The same case was noted for the stronger preferences of women for Social Sciences (in the upper prestige hemisphere) and much lower preferences, compared to men for Construction/Repair, Manual Work, and Quality Control. Šverko's study on teenagers and students from Croatia reported no gender differences on Business Detail and Financial analysis, and gender differences were not found to be statistically significant on these types for any of the three samples of this study.

When considering gender differences in Holland's RIASEC vocational interest types, in all three samples of the current study, the most pronounced differences were for the realistic type, in favor of men and on the social type in favor of women. These are indeed types that are well understood to be the points of highest differences between genders. This was previously reported both by the meta-analysis of Su et al. (2009) and in the other mentioned studies in Germany and Croatia. Cohen's d statistics reported in the mentioned meta-analysis were .84 for the Realistic type (in favor of males) and .68 on the social type (in favor of females). Differences in all three samples of the current study are in the same directions, but generally somewhat higher, with some d values even being above 1. Of the other RIASEC types in the samples of the current study, females tended to have higher scores on the Artistic type, while this was the case with the Conventional type for males. This differs from the results reported in the meta-analysis by Su et al. (2009) in that this meta-analysis reported females having higher average scores in both of these types. On the other hand, this study reported males having higher scores on the Investigative type, while, in the current study, such a difference was obtained only on the Bulgarian sample, while gender differences on this particular type were not statistically significant for the Serbian and North Macedonian samples.

When comparing the findings of the current study to those reported by Šverko (2008), gender differences found on the three samples of the current study on the spherical interest

types match the directions of 12 (North Macedonian sample) and 14 (Bulgarian and Serbian samples) of the 18 types of the spherical model.

The study contributes to the knowledge about gender differences in vocational interests in the three studied neighboring Balkan countries, but it also has certain limitations. First, the respondents of all three studies were predominantly students of social sciences and humanities. This was true for the entirety of the Bulgarian and North Macedonian samples, and to a large extent true for the Serbian sample. Studies on general populations might provide somewhat different results. On the other hand, comparisons of the strongest differences found in previous research showed that the direction of these largest differences seems to be stable across countries and cultures and that they are indeed very large in all the studies. However, the difference in prestige that was found might indeed be a peculiarity of our samples consisting primarily of students of social sciences. It might be the case that, while males, although studying in order to have careers in higher prestige professions, have fewer issues with endorsing lower prestige activities such as manual work and construction than women studying for high prestige activities. Endorsing views of female emancipation might make female students less willing to endorse low prestige, traditionally female jobs than male students have endorsing low prestige, traditionally male jobs and activities. It might be possible that on a sample of people from the general population, outside of universities, a comparison of genders on the Prestige dimension would be different. Additionally, the fact that most of the respondents were students of humanities and social sciences might make the samples selective with regards to their vocational interests, although the inspection of average scores does not seem to show particularly high scores on the Social Science type compared to other vocational interest types.

It can be concluded that the study found pronounced gender differences in vocational interest types that indicated that men preferred jobs and activities that involved working with things much more than women. Women preferred jobs and activities what involved working with people much more than men. These differences were large and consistent across all three countries. The study also found differences in preferences for jobs and activities of different prestige, with women having substantially higher preferences for prestigious jobs than men. However, this difference did not come so much from the higher preference for high prestige jobs, as it came from the much lower preference of women for low prestige jobs and activities such as manual labor and construction

REFERENCES

Browne, M. W. "Circumplex models for correlation matrices". *Psychometrika* 57, 4 (1992): 469–497. https://doi.org/10.1007/BF02294416

Cohen, J. *Statistical Power Analysis for the Behavioral Sciences,* 2nd Edition. Lawrence Erlbaum Associates, 1988.

Darcy, M. "Examination of the structure of Irish students' vocational interests and competence perceptions". *Journal of Vocational Behavior* 67 (2005): 321–333. https://doi.org/10.1016/j.jvb.2004.08.007

Darcy, M. & T. J. G. Tracey. "Integrating Abilities and Interests in Career Choice: Maximal Versus Typical Assessment". *Journal of Career Assessment* 11, 2 (2003): 219–237. https://doi.org/10.1177/1069072703251614

Etzel, J. M., G. Nagy, & T. J. G. Tracey. "The Spherical Model of Vocational Interests in Germany". *Journal of Career Assessment* 24, 4 (2016), 701–717. https://doi.org/10.1177/1069072715616122

Farmer, H., S. Rotella, C. Anderson, & J. Wardrop. "Gender differences in science, math, and technology careers: Prestige level and Holland interest type". *Journal of Vocational Behavior 53* (1998): 73–96. https://doi.org/10.1006/jvbe.1997.1608

Glidden-Tracey, C. E., & M. I. Parraga. "Assessing the Structure of Vocational Interests among Bolivian University Students". *Journal of Vocational Behavior* 48, 1 (1996): 96–106. https://doi.org/10.1006/jvbe.1996.0010

Hedrih, V. "Structure of vocational interests in Serbia: Evaluation of the spherical model". *Journal of Vocational Behavior* 73, 1) (2008): 13–23. https://doi.org/10.1016/j.jvb.2007.12.004

Hedrih, V. "Profesionalna interesovanja i osobine ličnosti. *Godišnjak za psihologiju* 6, 8 (2009): 155–172. http://www.psihologijanis.rs/clanci/67.pdf

Hedrih, V. "Provera konvergentne i diskriminativne validnosti analizom multiosobinske-multimetodske matrice na primeru PGI testa profesionalnih interesovanja zadatom uzorku iz Republike Makedonije. *Primenjena Psihologija* 4 (2011): 393–408. http://primenjena.psihologija.ff.uns.ac.rs/index.php/pp/article/view/1138/1152

Hedrih, V. *Adapting Psychological Tests and Measurement Instruments for Cross-Cultural Research: An Introduction*, 1st Edition. Routledge, Taylor&Francis Group, 2020.

Hedrih, V., & A. Hedrih. *Interpreting statistics for beginners: A guide for behavioural and social scientists*. Routledge, Taylor&Francis Group, 2022. https://doi.org/10.4324/9781003107712

Hedrih, V., M. Stošić, I. Simić, & S. Ilieva. "Evaluation of the hexagonal and spherical model of vocational interests in the young people in Serbia and Bulgaria". *Psihologija* 49, 2 (2016): 199–210. https://doi.org/10.2298/PSI1602199H

Hedrih, V., & I. Šverko. "Evaluation of the Holand model of the professional interests in Croatia and Serbia". *Psihologija* 40, 2 (2007). https://doi.org/10.2298/PSI0702227H

Hedrih, V., I. Šverko, & I. Pedović. "Structure of vocational interests in Macedonia and Croatia - Evaluation of the spherical model". *Facta Universitatis, Series: Philosophy, Sociology, Psychology and History* 17, 1 (2018): 19–36. https://doi.org/10.22190/FUPSPH1801019H

Hofstede, G. "Dimensionalizing Cultures: The Hofstede Model in Context". *Online Readings in Psychology and Culture* 2, 1 (2011). https://doi.org/10.9707/2307-0919.1014

Hofstede, G., B. Neuijen, D. D. Ohayv, & G. Sanders. "Measuring Organizational Cultures: A Qualitative and Quantitative Study Across Twenty Measuring Organizational Cultures". *Administrative Science Quarterly* 35, 2 (1990): 286–316.

Hogan, R., & R. Blake. "John Holland's Vocational typology and personality theory". *Journal of Vocational Behavior* 55, 1 (1999): 41–56. https://doi./DOI 10.1006/jvbe.1999.1696

Holland, J. L. "A Theory of Vocational Choice". *Journal of Counseling Psychology* 6, 1 (1959).

Holland, J. L. *Self-directed Search: Assessment Booklet, A Guide to Educational and Career Planning*. Psychological Assessment Resources, Inc., 1994.

Iliescu, D., D. Ispas, A. Ilie, & A. Ion. "The Structure of Vocational Interests in Romania Competing Models for the Structure of Vocational Interests". *Journal of Counseling Psychology* 60, 2 (2013): 294–302. https://doi.org/10.1037/a0032199

Larson, L. M., P. J. Rottinghaus, & F. H. Borgen. "Meta-analyses of Big Six Interests and Big Five Personality Factors". *Journal of Vocational Behavior* 61, 2 (2002): 217–239. https://doi.org/10.1006/jvbe.2001.1854

Long, L., R. S. Adams, & T. J. G. Tracey. Generalizability of interest structure to China: Application of the Personal Globe Inventory. *Journal of Vocational Behavior* 66, 1) (2005): 66–80. https://doi.org/10.1016/j.jvb.2003.12.004

Long, L., & T. J. G. Tracey. "Structure of RIASEC scores in China: A structural meta-analysis". *Journal of Vocational Behavior* 68, 1 (2006): 39–51. https://doi.org/10.1016/j.jvb.2005.01.002

McKay, D. A., & D. M. Tokar. "The HEXACO and five-factor models of personality in relation to RIASEC vocational interests". *Journal of Vocational Behavior* 81, 2 (2012): 138–149. https://doi.org/10.1016/j.jvb.2012.05.006

Nauta, M. M. "The Development, Evolution, and Status of Holland's Theory of Vocational Personalities: Reflections and Future Directions for Counseling Psychology". *Journal of Counseling Psychology* 57, 1 (2010): 11–22. https://doi.org/10.1037/a0018213

Prediger, D. J. "Dimensions Underlying Holland's Hexagon: Missing Link between Interests and Occupations?" *Journal of Vocational Behavior* 21 (1982): 259–287.

Rounds, J., & T. J. G. Tracey. "Prediger's Dimensional Representation of Holland's RIASEC Circumplex". *Journal of Applied Psychology* 78, 6 (1993): 875–890.

Savickas, M. L. "Identity in Vocational Development". *Journal of Vocational Behavior* 27 (1985): 329–337.

Smart, R., & C. Peterson. "Super's Career Stages and the Decision to Change Careers". *Journal of Vocational Behavior* 51 (1997).

Sodano, S. M. "Integrating work and basic values into the Spherical Model of Interests". *Journal of Vocational Behavior* 78, 1 (2011): 1–10. https://doi.org/10.1016/j.jvb.2010.09.004

Sodano, S. M., & T. J. G. Tracey. "Prestige in interest activity assessment". *Journal of Vocational Behavior* 73, 2 (2008): 310–317. https://doi.org/10.1016/j.jvb.2008.07.002

Su, R., J. Rounds, & P. I. Armstrong. "Men and Things, Women and People: A Meta-analysis of Sex Differences in Interests". *Psychological Bulletin* 135, 6 (2009): 859–884. https://doi.org/10.1037/a0017364

Super, D. E. "A Life-Span, Life-Space Approach to Career Development". *Journal of Vocational Behavior* 16 (1980): 282–298.

Šverko, I. "Spherical model of interests in Croatia". *Journal of Vocational Behavior* 72 (2008): 14–24. https://doi.org/10.1016/j.jvb.2007.10.001

Šverko, I. & T. Babarović. "Integrating personality and career adaptability into vocational interest space". *Journal of Vocational Behavior* 94 (2016): 89–103. https://doi.org/10.1016/j.jvb.2016.02.017

Šverko, I., & V. Hedrih. "Evaluacija sfernog i heksagonalnog modela strukture interesa u hrvatskim i srpskim uzorcima". *Suvremena nsihologija* 13, 1 (2010): 47–62.

Tak, J. "Structure of Vocational Interests for Korean College Students". *Journal of Career Assessment* 12, 3 (2004): 298–311. https://doi.org/10.1177/1069072703261555

Tokar, D. M., & A. R. Fischer. "More on RIASEC and the five-factor model of personality: Direct assessment of Prediger's (1982) and Hogan's (1983) dimensions". *Journal of Vocational Behavior* 52, 2 (1998): 246–259. https://doi.org/10.1006/jvbe.1997.1585

Tracey, T. J. G. "Personal Globe Inventory: Measurement of the spherical model of interests and competence beliefs". *Journal of Vocational Behavior* 60, 1 (2002): 113–172. https://doi.org/https://doi.org/10.1006/jvbe.2001.1817

Tracey, T. J. G., & J. Rounds. "Evaluating the RIASEC Circumplex Using High-Point Codes". *Journal of Vocational Behavior* 41 (1992): 295–311.

Tracey, T. J. G., & J. Rounds. "An Examination of the Structure of Roe's Eight Interest Fields". *Journal of Vocational Behavior* 44 (1994): 279–296.

Tracey, T. J. G., & J. Rounds. "The Arbitrary Nature of Holland's RIASEC Types: A Concentric-circles Structure". *Journal of Counseling Psychology Rounds & Tracey Rounds & Zevon* 42, 4 (1995): 431–439.

Tracey, T. J. G., & J. Rounds. "The Spherical Representation of Vocational Interests". *Journal of Vocational Behavior* 48 (1996): 3–41. https://doi.org/DOI: 10.1006/jvbe.1996.0009

Tracey, T. J. G., N. Watanabe, & P. L. Schneider. "Structural Invariance of Vocational Interests Across Japanese and American Cultures". *Journal of Counseling Psychology* 44, 4 (1997): 346–354.

Vardarlı, B., R. Özyürek, K. G. Wilkins-Yel, & T. J. G. Tracey. "Examining the structure of vocational interests in Turkey in the context of the personal globe model". *International Journal for Educational and Vocational Guidance* 17, 3 (2017): 347–359. https://doi.org/10.1007/s10775-016-9338-6

POLNE RAZLIKE U PROFESIONALNIM INTERESOVANJIMA U TRI BALKANSKE ZEMLJE

Osnovni cilj ovog istraživanja je bilo ispitivanje polnih razlika u profesionalnim intersovanjima u tri susedne balkanske zemlje – Srbiji, Bugarskoj i Severnoj Makedoniji. Profesionalna interesovanja su operacionalizovana preko sferičnog modela profesionalnih interesovanja i preko Holandovog cirkumpleksnov RIASC modela. U ovom istraživanju su reanalizirani podaci iz prethodno objavljenih studija u kojima su prikupljeni podaci o profesionalnim interesovanjima u ovim zemljama. U istraživanju je učestvovalo 2356 mladih ljudi, studenata osnovnih studija u slučaju Bugarske i Severne Makedonije i mladih ljudi iz opšte populacije, ali sa velikim udelom studenata u Srbiji. Učesnici su popunjavali Personal Globe Inventory, PGI upitnik profesionalnih interesovanja. Rezultati su pokazali postojanje izraženih polnih razlika duž Ljudi-Stvari dimenzije profesionalnih interesovanja sa Koenovim d vrednostima razlike između polova koje su se kretale od 1.34 do 1.5 u poduzorcima iz ove tri zemlje. Pokazalo se da muškarci u proseku više od žena vole poslove i aktivnosti koje uključuju rad sa stvarima, dok žene više od muškaraca vole poslove i aktivnosti koji uključuju rad sa ljudima. Substantivna, ali manja, razlika dobijena je i na dimenziji profesionalnih interesovanja Prestiž, pri čemu su žene imale u proseku više skorove od muškaraca. Ove razlike delom potiču od izraženijih preferencija žena za visoko prestižne poslove, ali mnogo većim delom od toga što žene mnogo manje preferiraju nisko prestižne poslove i aktivnosti od muškaraca. Poređenja su rađena i u pogledu skorova na tipovima profesionalnih interesovanja i najveće dobijene razlike su odgovarale onima koje su nađene u dobijene u drugim zemljama sveta.

Ključne reči: *profesionalna interesovanja, sferični model profesionalnih interesovanja, polne razlike, Srbija, Bugarska, Severna Makedonija*