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## Work Satisfaction of Female Scientists in the Serbian Post-Socialist Transformation Context\*

**Abstract:** This article studies the level of female scientists' work satisfaction, and general and gender-related factors that would contribute to greater work satisfaction. We applied an interdisciplinary approach – we draw on Bronfenbrenner's ecological model of (professional) development, sociological analysis of the context and linguistic analysis of the text. A hundred Serbian female scientists filled in the online questionnaire. They reported moderate satisfaction with their work. Thematic analysis of their answers yielded nine general work satisfaction improvement factors: *Creating a fair and effective management and improving relations with superiors*, *Improving social relationships with peers* (Bronfenbrenner's micro- and meso-system), *Improving technical resources*, *Increasing salaries*, *Professional improvement support*, *The modernization and application of scientific work*, *Improving human resources*, *Establishing transparent, consistent and fair system rules* (exosystem) and *Combating corruption and nepotism* (macrosystem). Six gender-related factors were determined: *Overcoming social obstacles related to pregnancy and child-care*, *Change in attitudes in cases of*

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*harassment* (micro– and meso-system), *Overcoming legal obstacles related to pregnancy and child-care*, *Change in procedures in cases of harassment* (exosystem), *Achieving respect and equality*, and *Changing social image through personal efforts* (macro-system). Recommendations for policy and practice improvement are discussed in the light of the dominant values in the Serbian post-socialist transformation context.

**Key words:** women, science, work satisfaction, post-socialist transformation, Serbia, Bronfenbrenner's ecological model

## Introduction

Although the number of female scientists has been increasing in the last few decades, it continues to be disproportionately lower than the number of male scientists in most countries (Blickenstaff 2005; Ellis 2003; Fox 2010; Noordenbos 2002). This is particularly true in the fields of Science, Mathematics, Engineering and Technology (STEM), where women usually represent less than 10% of full professors (Bagilhole 2007; Gupta et al. 2005; Fox 2010). We notice a similar pattern in Serbia – there are more women in Social Sciences than in Science and Technology, and although they form majority of PhD holders their representation decreases as we move up the hierarchy and status ladder (Babović 2016; Blagojević 2005; Bogdanović 2006; Enwise Report 2003; Statistical office of the Republic of Serbia, 2017). We intended to build on current studies on women in academia by exploring the issues of work satisfaction and experience of gender inequality and discrimination of Serbian female scientists engaged in different scientific fields, applying an interdisciplinary approach.

In the beginning of this paper we will present the findings from international and Serbian studies on the contextual factors that influence women's scientific career and work satisfaction. We will afterwards provide an overview of the position of (female) scientists in the context of dominant social (particularly, gendered) values in the Serbian society.

### *Factors Influencing Women's Scientific Career*

Besides individual factors, such as interests and values (which are a result of socialization), many wider social and organizational factors contribute to a fewer number of women in science. Studies showed that females are indirectly prevented from choosing a scientific career (particularly in STEM disciplines) from an early age (Diekman, Brown Johnston and Clark, 2010; House of Commons, Science and Technology Committee 2014; Smith, Pasero and McKenna 2014; Šadl 2009).

Even if they overcome barriers from primary and secondary school and tertiary education related to families', teachers' and the wider public's beliefs, val-

ues and practices, and their own self-concepts (Diekman et al. 2010; Smith et al. 2014), and decide to pursue a scientific career, women experience discrimination at their workplaces. These are assumed to be gender-neutral, but in reality, they are zones for social construction of gender, that usually reinforce the culture's gender definitions (Meier 2013). Starting from the recruiting process, there is a bias against women – both male and female professors rated the male applicants as significantly more competent and preferable to hire than the (identical) female applicants, and they offered male candidates higher starting salaries and additional career mentoring support (House of Commons, Science and Technology Committee 2014; Sonnert and Fox 2012). Women are perceived as less committed to work by their superiors even when they have the same scientific performance as their male colleagues (Ellmers et al. 2004). An additional problem is empirically proven gender-based discrimination in the domains of publishing and grant applications reviewing (Ceci and Williams 2011).

Even those who are successful in academia have fewer chances to be directly involved in important decision making, as women seldom reach managerial positions. They continue to come across a “glass ceiling” which represents an informal, often invisible barrier for improving their status (Baranović 2011; Blagojević 2005; Enwise Report 2003). The phenomenon of subtle discrimination and exclusion, recognized by Glick and Fiske (1996) as benevolent sexism, can be also explained by the theory of “social closure” (Murphy 1988) or “network theory” (Van Balen 2001, according to Noordenbos 2002), both pointing to the organization of the scientific community in a way that hampers the accessibility of important information, knowledge and contacts to women.

Regarding organizational factors, those present in the immediate workplace, Fox (2010) found that women scientists had fewer opportunities for an exchange of ideas than their male colleagues, they had a significantly lower sense of inclusion in their home units and lower recognition from faculty, and they gave significantly lower ratings for access to equipment. Moreover, they perceived their home units as more formal, boring, unhelpful and non-creative, compared to their male counterparts. Some other researchers also pointed to the scientific environment being male-dominated, highly impersonal, and individualistic (Suresh, 2006). At the same time women working in scientific institutions suffer from the duality of being both ‘invisible’ and ‘extra-visible’ and like all minorities, they are less confident of their abilities, less willing to take risks, less able to negotiate for their needs, and they experience performance pressures, and marginality at their units (Bagilhole 2007; Gibson 2006; Tomić 2010). Besides that, women are likely to get more administrative chores and tasks related to teaching and pastoral care of students than their male colleagues, to get smaller laboratory space and fewer research resources, and to earn less than men even if they are equally productive (Bagilhole 2007; Ceci and Williams 2011; Hill, Corbett and Rose 2010; Hodges 2017).

### *Factors Influencing Female Scientists' Work Satisfaction*

We can assume that factors that hamper women's access to academia and their further academic endeavours can also negatively affect female scientists' work satisfaction. However, only a modest number of studies addressed directly the factors influencing job satisfaction and gender differences in job satisfaction among faculty members (Sabharwal and Corley 2009). Regarding the relationship between specific organizational attributes and work satisfaction, it has been determined that a negative departmental culture, lowered advancement opportunities, unjust faculty leadership, and a lack of research support are factors that are most specific to lower work satisfaction of female scientists, compared to their male counterparts (Hill et al. 2010; Sabharwal and Corley 2009). Other studies conducted in an academic context point to the negative correlation between job satisfaction and women's perceptions of both formal and informal discrimination (e.g. unequal access to hiring, promotion, equipment and resources, and gender derogation) (Settles et al. 2012). Within the Serbian context, we came across only one research, grounded in the Herzberg's two-factor theory of motivation, performed with scientists from one Serbian state University, where the author found that women are less satisfied with their jobs than their male colleagues, mostly due to fewer chances for promotions, lower salaries and an overall underestimation of them as professionals (Bojanić 2014).

In research conducted with the general female population in the UK, it was determined that women's job satisfaction increases as the female share of the workplace increases (Sloane and Williams 2000). On the other hand, increased and inflexible working hours are associated with lower job satisfaction among women (but not among men), mostly due to organizational challenges they cause with regard to family and household responsibilities that women have (Bender, Donohue and Heywood 2005). If we extrapolate these findings to the academic context, we might assume that the proportion of women at the workplace (which is usually low) and working hours (which are usually very long and inflexible) might be particularly relevant aspects of work contributing to the dissatisfaction among women pursuing a scientific career, in addition to interpersonal relationships and discrimination at work.

### *Women and Science in Serbia – Study Background*

In order to understand the issue of Serbian female scientists' work satisfaction, it is necessary to understand the wider contextual framework: the position of scientists in general, the position of female scientists in particular and the position of women in Serbian society.

Regarding the status of science and scientists in the Republic of Serbia, it is necessary to point that the share of budgetary funds for research and develop-

ment activity constitutes 0.42% of GDP, whereas the OECD average is about 0.7% of GDP, according to data from the UNESCO Institute for statistics from 2015<sup>1</sup>. Nearly one half of the budgetary funds (45.52%) are intended for faculties and scientific institutes. However, these institutions may acquire funds from other sources as well: students (tuition fees), donations, sponsorships and other sources, projects and contracts related to the carrying out of study courses, research or consulting services. Some of the faculties and institutes have participated in the Tempus programme, the Seventh Framework Programme (FP7), and similar, although there are many differences between institutions, depending on the scientific discipline (European Commission 2012; Statistical Office of the Republic of Serbia 2015).

Similar to other countries, young researchers sign short-term contracts, which represent a barrier for job security, particularly to women who are considering starting families (Ellis 2003). In addition, monthly salaries for research assistants are about 740 Euros gross (for principal research fellows and full professors – about 1000) (European Commission 2012), which is far less than in EU countries (European Commission 2007). This results in dissatisfaction with the salary (especially among those for whom it is the only source of income), and the need for additional jobs (mostly at international projects at Universities or in the NGO sector) (Ocokoljić, Kleut and Radovanović 2015).

In addition to the challenges all Serbian scientists face regarding investments in science in general, their income and the workload, female scientists experience what some researchers have labelled as the “misogynistic” (or, at least, homosocial) features of the university community (Milić 2005, 71; Šadl 2009). Women were allowed to take university level courses after The First World War, but gaining degrees and honours, as well as employment at the University, was not allowed. By 1950 only nine women gained a PhD degree at the Belgrade University, and only two of them had managed to reach the title of university professors. From 1947 to 2001 only 27% of all the students who earned a master’s degree and 22% of those who gained a PhD degree were women (Popović and Duhaček 2011). In the last years the number of female PhD holders increased, surpassing the number of males with PhD, but their representation in scientific community is still about 5% lower than males’ (Statistical office of the Republic of Serbia 2017). Inequality is also reflected in the segregation of educational profiles and the participation of women in managerial positions. Thus approximately 65% female students enrol at the faculties of social sciences and art colleges, 50% at the medical faculty, while only 25% of the students at technical faculties are female. An analysis of the profile of university staff shows that only 9% of employees at the Faculty of Engineering and 6% at the

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<sup>1</sup> See: <http://data.uis.unesco.org/>

Faculty of Mechanical Engineering are women. In the history of the Serbian Academy of Arts and Sciences women have never had a leading position, and currently more than 90% of all members of the Serbian Academy of Arts and Sciences are men (Popović and Duhaček 2011; Statistical office of the Republic of Serbia 2017).

Although the scientific community is the main focus of this study, the social context of Serbian society and the dominant value orientation additionally give a broader insight into the position of women in general, and in the scientific field in particular. During the socialist era, Serbian women (including female scientists) were engaged in “full employment”, unlike a *part time job*, which was dominant in most industrial countries in the 1980s (Scandinavia, West Germany, UK). This pattern influenced women’s economic autonomy and gender awareness, which affected the profiling of their goals in the labour market in the future (Galić 2011). At that time Serbia was a semi-peripheral country<sup>2</sup> with a developed welfare state system.

At the end of the 1980s the social, political and economic system collapsed. The processes, which brought political democracy and market economy in the old, socialist institutional and social environment, collapsed shortly after. This process is well known as the Post-Socialist Transformation (PST) (Lazić 2000). In the period of PST, a vast number of studies of values showed the tendencies toward the strengthening of patriarchy, familiarity and traditions, and therefore worsening the position of women in both private and professional sphere (Hugson 2018; Kuzmanović 1995; Lazić and Cvejić 2007; Lazić 2005, 2011; Radonjić and Jarić 2015). Along with the changes in value systems during PST, the tendency of the state to reduce the state-sponsored childcare benefits, maternity leave and state-funded kindergartens (recognized as the roots of “market discrimination”) additionally affected women’s position in the labour market (Glass and Kawachi 2001). The position of women scientists was further hampered due to the shift from strong social prestige attached to academic knowledge of the cosmopolitan scientists to anti-science leanings and oppressive stance of the regime towards “disobedient” academics (Hodges 2017). These tendencies have continued in the following years, so we have witnessed women dealing with low salaries, work hours rising, workplace bullying, while the time-consuming demands of the household and family caring have not changed (Blagojević 2005; Hugson 2018).

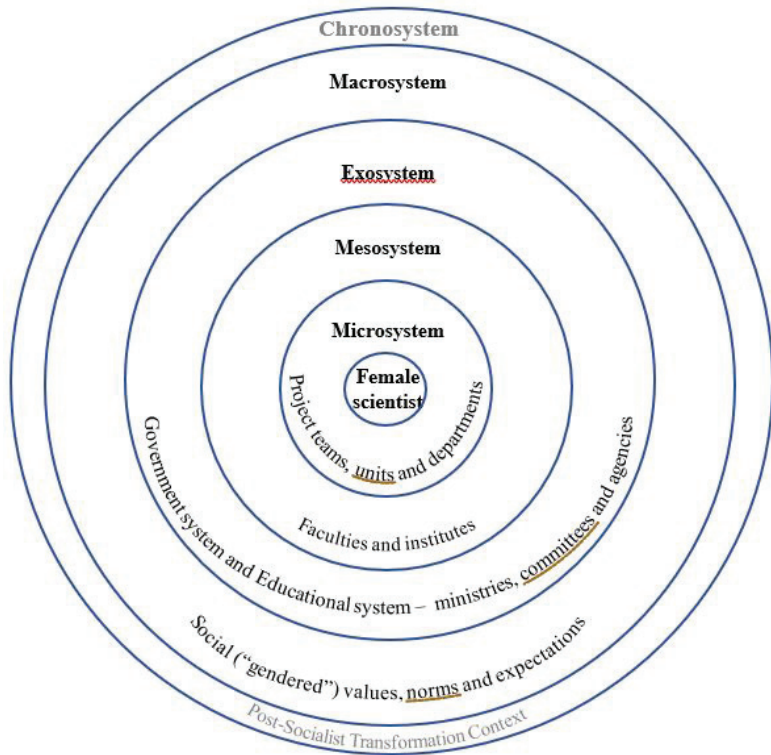
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<sup>2</sup> The former communist semi-peripheral countries have inferior position in the knowledge production. The center is recognized as a creator of “intellectual activity” and the semi-periphery – as “executive”. This is an additional problem for women scientist from the Serbian society – their exclusion is based on two criteria: gender and center – semi-periphery (Blagojević 2005, 47, 52).

## Study Goals

In academic writing, studies on gender inequalities have a relatively short history – they have not been conducted until the Sixties, due to the strong segregation in different scientific fields, with a higher percentage of female scientists in social science and a higher percentage of male scientists in STEM disciplines. In the Serbian context, studies addressing the position of female scientists were rare (e.g. see Bojanić 2014; Simić and Đorđević 2016; Tomić 2010), which motivated us to explore social, system and organizational factors that may influence women’s scientific careers and their satisfaction with work. The main goal of this research was to determine the level of work satisfaction of female scientists in Serbia, defined as the way they feel about their job and whether they like it, and to explore the social, system and organizational factors that would contribute to greater work satisfaction. We focused on two groups of factors that would lead toward greater work satisfaction, that we labelled as general or gender-neutral, and gender-related factors. Additionally, we investigated the female scientists’ experience of gender-based discrimination at work.

In order to better understand social and organizational factors that may impact female scientists’ work satisfaction, and to systematize recommendations for policy and practices change, we draw on Bronfenbrenner’s (1992) ecological model and further elaboration of this model (e.g. Neal and Neal 2013). This model asserts that development (including professional development) is a function of the interaction between the person and their environments, and that it occurs in a nested arrangement of systems, each contained within the next. We believe that professional development and work satisfaction of female scientists are highly dependent on the characteristics of the Bronfenbrenner’s “layers” of environment – microsystem (immediate workplace – e.g. project team, unit or department), mesosystem (institution in which the person is employed – e.g. institute or faculty), exosystem (higher-order institutions, such as ministries, agencies and committees) and macrosystem (broader social values, norms and expectations in a Serbian context). In line with Neal and Neal (2013), we consider these systems as “overlapping arrangement of structures, each directly or indirectly connected to the others by the direct and indirect social interactions of their participants” (p. 1). Therefore, we will pay attention to all four layers (see Picture 1) and their interaction when analysing data, drawing conclusions and providing recommendations. Although the Bronfenbrenner’s Chronosystem includes both major life transitions, and socio-historical events that occur during a person’s development, we will only address socio-political context in which our participant are immersed.



Picture 1. Systems that influence female scientists' academic careers in line with Bronfenbrenner's ecological model

## Methodology

### *Participants*

One hundred female researchers and scientists from different towns in Serbia, aged between 26 and 68 participated in this research ( $M=35.14$ ,  $SD=8.45$ ). At the moment of data collection, most participants had a PhD degree (41%) or were doctoral students (40%), engaged in diverse scientific disciplines (Table 1). The great majority were employed at state faculties (85%), meaning they were engaged both in teaching and research, whereas 12% were employed at state research institutes as full-time scientists and 3% in private companies. This proportion reflects well the structure of the entire scientific population in Serbia, being mostly bound to Universities and only in some disciplines (e.g. Pharmacy, Veterinary Medicine or Engineering) to the private sector.



Table 1. Characteristics of the study participants

Degree	Scientific discipline				Total
	Humanities and Social Science	Science and Mathematics	Engineering and Technology	Medical Science	
Bachelor	0	1	1	0	2 (2%)
Masters	5	1	3	3	12 (12%)
PhD student	12	13	12	3	40 (40%)
PhD	8	8	12	13	41 (41%)
Other	1	1	2	1	5 (5%)
Total	26 (26%)	24 (24%)	30 (30%)	20 (20%)	100 (100%)

Our participants mostly opted for a scientific career during their studies (31%) or after graduation (28%) due to predominantly intrinsic motivational factors. When different motivation factors were assessed, they gave the highest marks to factors *Doing science is intellectually stimulating* ( $M=4.49$ ,  $SD=.54$ ) and *Science is interesting and inspiring* ( $M=4.49$ ,  $SD=.56$ ) and lowest to *Good salary* ( $M=2.1$ ,  $SD=.95$ , range 1 to 5).

### *Approach to data*

Participants were approached via email after their email addresses were selected from the websites of diverse state and private institutions, using random sampling method within above mentioned four disciplines. After a short explanation of the purpose and the topic of the study in the email, participants had an opportunity to fill in an online questionnaire. The response rate was 29.24%, which was not unexpected given that response rate for online surveys rarely surpass 40%, even if reminders are sent (Saleh and Bista 2017). In our case such a response rate might be a result of two factors—outreach and motivation. We might assume that some of the addresses collected from the websites were not active, up to date or regularly checked by their owners, and we believe that some potential participants were not motivated enough to complete a questionnaire. However, we do not consider this response rate problematic for our further conclusions; only we should stress that younger females prevailed, so that the conclusions might have a limited generalisation potential on female scientists with more years of work experience.

The questionnaire consisted of 21 questions. Five five-point Likert-type scales, ten multiple-choice and six open ended questions, all newly developed

for this research, were applied. We collected sociodemographic data, data on the participants' career path (when they opted for a scientific career, what challenges they came across, what kind of support they received or lacked etc.), motivation for a scientific career, work satisfaction, factors that would contribute to greater satisfaction, and potential examples of gender-related discrimination.

In this paper, we analysed only answers to questions that were relevant for accomplishing the study goals. Participants assessed the level of their work satisfaction on one five-level Likert item ("How satisfied are you with your job?", with 1 standing for "very dissatisfied" and 5 – for "very satisfied"). In two open-ended question ("What should be changed in order to give you *as a scientist* a higher level of satisfaction with your job? Please indicate as many issues as you would like." and "What should be changed in order to give you *as a female scientist* a higher level of satisfaction with your job? Please indicate as many issues as you would like.") they had an opportunity to describe gender-neutral and gender-related factors that would make them more satisfied with their job. Finally, our participants were asked whether they had been treated differently by their managers because of their gender, and if so, in what way (in a multiple-choice question they could mark all examples of gender-based discrimination at work they experienced).

Descriptive statistics were performed for the questions regarding work satisfaction and experience with discrimination, while for the questions referring to work satisfaction improvement factors, qualitative text analysis (i.e. thematic analysis) was applied, as suggested by Kuzkartz and Mayring (Kuckartz 2014; Mayring and Brunner 2010). We applied a combination of deductive and inductive approaches. First, we categorized answers into four categories representing four Bronfenbrenner's contextual layers, depending on which level the participants perceived as having a key role in providing solutions for the improvement of their position and work satisfaction. Subsequently, within each layer, we were looking for the themes<sup>3</sup> that repeatedly appeared in the participants' answers. We created a matrix that embraced predefined categories reflecting contextual layers, and authentic, original themes that we derived from the participants' answers. Through doing this we were able to define which layer has a key role in initiating the changes that would lead to a better position of women scientists and, consequently, their higher work satisfaction, and to define concrete recommendations for the stakeholders from these layers.

Since we were not able to provide triangulation of data, as a validation strategy (Denzin 1978; Flick 2000), we strived to provide investigator triangulation, and thus to approach data from interdisciplinary perspective. Since we cannot understand individual's psychological processes without knowing the context in which that in-

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<sup>3</sup> Notions themes, categories and factors, as well as subthemes, subcategories and subfactors will be used interchangeably.

dividual is living, we relied on Bronfenbrenner's ecological model of professional development and sociological analysis of prevailing values in the Serbian post-transformation society. Two researchers performed data analysis – one psychologist and one researcher with the professional background in linguistics. After they negotiated the themes stemming from the participants' answer, they discussed the results with the third researcher (sociologist) and a critical friend with expertise in gender issues. In this way we ensured *interpretation in groups* and “*peer de-briefing*”, advocated by, among others, Lincoln and Guba (1985), and Strauss (1987), as techniques of guaranteeing comprehensibility of the research.

## Results

### *General Work Satisfaction Improvement Factors*

In general, participants stated that they are relatively satisfied with their work ( $M=3.54$ ,  $SD=.88$ ). The thematic analysis of participants' answers on open ended question yielded nine categories of gender-neutral factors that would contribute to greater work satisfaction, classified within four categories representing Bronfenbrenner's layers (see Table 2).

Table 2. General work satisfaction improvement factors

Bronfenbrenner's contextual layers	Themes	Themes' Frequencies (176)
Microsystem	– Creating a fair and effective management and improving relations with superiors	37 (15.42%)
Mesosystem	– Improving social relationships with peers	29 (12.08%)
Exosystem	– Improving technical resources	32 (13.33%)
	– Increasing salaries	20 (8.33%)
	– Professional improvement support	16 (6.67%)
	– The modernization and application of scientific work	14 (5.83%)
	– Improving human resources	14 (5.83%)
Macrosystem	– Establishing transparent, consistent and fair system rules	10 (4.17%)
	– Combating corruption and nepotism	4 (1.67%)

As it can be seen from the table, it was difficult to separate participants' answers that referred to the microsystem (participant's small work unit) and mesosystem (institution in which participant is employed), so we assigned two categories to both layers. We labelled the first, predominant theme **Creating a fair and effective management and improving relations with superiors**. The majority of participants stated that their work satisfaction would increase if the quality of the management and relations with superiors were better. More specifically, this theme referred to the need for transparency and fairness of

management policies in the allocation of financial resources for research, employment and promotion, and division of labour. It also referred to the need for clearer direction in project leading, more efficient work organization and research finalization. Our participants stressed that the voice of all scientists must be heard, regardless of their age or status, and that a more democratic decision-making process is necessary.

These answers implicitly revealed a lack of our participants' involvement in issues related to their immediate work, as well as overinvolvement in non-scientific issues (administrative and organizational), both related to unfairness of management and inefficient work organization. Some of the typical answers were:

Ana<sup>4</sup>: *"It is necessary for every scientific institution to ensure the same voting rights for all its members and researchers at office meetings, especially when it's deciding on our rights and status."*

Marta: *"I would like to know what exactly my field of activity for the job is, and not to be used for operations (I may say chores) that are not my area of expertise, and most of the time beneath my level of education."*

One participant also recognized the issue of gender inequality underlying the problem of inadequate division of labour: *I would like more opportunities to work on equal tasks as men (not only "women's jobs" e.g. photocopying, writing and rewriting and similar).*

This theme also included participants' answers that addressed the relationship with individual superiors. Our participants stated that better communication, a higher level of correspondence with superiors and less workplace bullying would contribute to greater work satisfaction.

The second theme present at the micro- and meso-level, **Improving social relationships with peers**, referred to the quality of relationships with colleagues of the same status. Participants reported envy, competitiveness (within the team), interference of private and professional life (e.g. *"Letting personal relationships and frustrations to affect work environment"*), drinking, disrespect and insulting language about women etc. Therefore, they stressed the need for better cooperation with their peers, more teamwork, mutual understanding, respect and readiness to help, and less individualism and jealousy.

One can see that the most work satisfaction improvement factors lay within the exosystem. Every seventh participant reported that work conditions were unsatisfactory. Within the theme **Providing technical resources** most frequently mentioned needs were: larger offices, better equipment, availability of software or diagnostics devices and accessibility of literature. The majority of participants' descriptions mention inadequate work space and equipment as their main concern, as the following statements reflect:

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<sup>4</sup> Participating in the research was confidential and anonymous, but for the purpose of presentation of the results we used fictional names.

Dunja: *“I work in an office of ten square meters, with two computers, with eight other colleagues. I would like to have my own desk, computer, work space. Also, I would like to not have to use my private laptop, camera, mobile telephone for the purpose of the job.”*

Andrea: *“A change of laws, which would enable better provision of supplies and equipment for work, without restrictions; more financial freedom, to purchase what is necessary for the everyday work and research routine.”*

Along with the issue of financial means for provision of better technical resources, our participants reported the insufficient income they get in academia. Descriptions within the category **Increasing salary** revealed profound displeasure with the incomes, as presented in the following example:

Tanja: *“Higher salaries that would unburden us from everyday concerns caused by financial problems!”*

In the category named **Professional improvement support**, participants reflected on the need for more opportunities for additional education and professional improvement by getting to know international scientific communities and practices through various study visits, training courses and conferences. The support that the respondents seek is primarily of a material nature (e.g. more grants for PhD students attending training and more funds for conferences). Our participants also stressed the need for the provision and sharing of information on scientific seminars and international projects, and the need for more open promotion of values of continuous improvement, lifelong learning and excellence in academia. A typical example is:

Stefana: *“The Possibility to visit foreign scientific communities through study visits that my University would support. Opportunities for additional education with final examinations that would check the quality of what I’ve learned.”*

The category **Modernization and application of scientific work** refers to the necessity of more complex and sophisticated types of scientific projects that the participants see as modern, interesting, inspiring and useful, as opposed to current old fashioned and irrelevant projects. Our participants would be more satisfied with their jobs if there were *“connections between science and industry”* and scientific cooperation with universities worldwide, if stakeholders were *“more open to innovations”*, and if projects were more relevant for Serbian society. The desire for the change of current application of scientific work in Serbia, i.e. its disconnection with economic and social needs, is reflected in all excerpts included in this category.

Participants’ answers that reflected the need for more professional and well qualified staff were subsumed under the category **Improving human resources**. Participants reported they are overloaded with work, both scientific and related to teaching, as in the following example:

Sanja: “*We need more staff hired in our department, because we are currently understaffed. With the current work overload, there isn't enough time for personal and professional development.*”

Several participants mentioned work satisfaction improvement factors that are related to **establishing transparent, consistent and fair system rules**, as opposed to the current state of affairs characterized by *constant changes of advancement conditions and time limits within which it is required to achieve results, lack of transparency of procedures and the decision-making process, pressure when it comes to promotion, inappropriateness of contracts and job insecurity*. One of the typical statements follows:

Simona: “*Regular changes of the conditions for advancement and timeframes demotivates me and prevents me from planning my career on time and doing creative work.*”

Finally, the only category that we classified as being at the macrolevel is **Combating corruption and nepotism**. Our participants stated they would be more satisfied with their work if the levels of nepotism and corruption in the processes of recruitment and promotion decreased. They perceive this problem as a broader social issue that consequently permeates the academic context.

### *Gender-Related Work Satisfaction Improvement Factors*

We applied the same methodology when analysing answers dealing with gender-specific factors that would contribute to a better position of female scientists and their greater work satisfaction. In the following table six derived categories “nested” in four Bronfenbrenner’s layers, with the frequencies of their mention are presented:

Table 3. Gender-Related Work Satisfaction Improvement Factors

Bronfenbrenner’s contextual layers	Themes	Themes’ Frequencies (32)
<i>Microsystem</i>	– Overcoming social obstacles related to pregnancy and child-care	3
<i>Mesosystem</i>	– Change in attitudes in cases of harassment	2
<i>Exosystem</i>	– Overcoming legal obstacles related to pregnancy and child-care	9
	– Change in procedures in cases of harassment	3
<i>Macrosystem</i>	– Achieving respect and equality	9
	– Changing social image through personal efforts	6

It was found that at the level of the workplace, the theme of maintaining work-life balance when a woman gets pregnant and has a child, is relevant.

Answers that we classified within the category **Overcoming social obstacles related to pregnancy and child-care** reflect the attitude of the scientific community and colleagues towards pregnancy and women with children, which is visible in the lack of collegiality and understanding for family obligations. Our participants would be more satisfied with their work if the following changes occurred: *enabling working from home and flexible working hours, laboratory access at any time, day care within the institution or company*, etc.

The second important topic for women was harassment at the workplace. Two participants stated that their colleagues publicly disapprove of discrimination and various forms of harassment at work, but do not recognize it or do not react when it happens, as explained in the following example:

Maja: *“When it comes to situations that are discriminatory in terms of gender, the community is explicit in its disapproval of discrimination, but isn’t as coherent in drawing any significant moves, which can be interpreted in the wrong way, even as a type of implicit approval of that discrimination.”*

Related to themes at the micro- and meso-level are two themes that lay within the level of ministries and other respective institutions, committees and state bodies. Within the category that we labelled as **Overcoming legal obstacles related to pregnancy and child-care**, participants most frequently reported insufficient financial support during maternity leave. They also pointed out the rigidity of rules regarding the organization of doctoral studies as well as procedures for work and promotion, which do not acknowledge the fact that someone took maternity leave – as stated by Jelena: *“Firstly, the time for a PhD thesis does not get extended during pregnancy, as the labour contract does. So, I have one year less to finish my dissertation than my male colleagues. That could improve.”*

Answers within the category **Change in procedures in cases of harassment** reflect a lack of confidence in legal protection in cases of harassment at the workplace. Participants would be more satisfied with their jobs if they were better legally protected, and if they were better informed about their rights and concrete procedures in cases of harassment. They emphasized the necessity of having an *“opportunity to report sexual and verbal harassment”*, and to *“have awareness of having somewhere to report it”*. Responses such as Vesna’s: *“Any kind of harassment, or irregularity, should be possible to report”* implies that there are certain irregularities that cannot be easily proved and reported, which results in the impossibility to fight against them in a regular, systemic way.

Finally, two categories refer to different opportunities for men and women, stereotypes and gender-related social expectations and norms, which impact work satisfaction of women scientists. **Achieving respect and equality** indicates a need for overcoming existing prejudice and stereotypes about women, reflected in statements such as:

Sofija: *“Respectable women should have decent manners, a gentle character, good work habits, obey the rules... Women who don’t fit to this model evoke repulsion, and almost aren’t considered as females.”*

Nina: *“Women are revered for being good organizers, problem solvers, and fine workers in pre-set conditions, but not as creators (of conditions).”*

As our participants reported, social expectations, norms and beliefs spill over into the professional field, preventing women from experiencing more equal opportunities and a respectful attitude towards women, from the side of both colleagues and the wider public.

The category **Changing social image through personal efforts** also points to inequalities and inadequate representation of women in the media and public discourse. In contrast to the previous category, where women stress the responsibility of society, answers within this category indicate the responsibility of every single woman in changing social expectations and norms. Six participants believe that they can achieve a better status, and therefore greater work satisfaction, only through personal efforts and models of professional behaviour. This strategy even implies working harder than men in order to achieve the same status – as explained by Lisa: *“I have not had any gender-related problems at work because I have more overtime than men, because I have never used my days off (50 remained unused from the last year) or sick leave.”*

Two participants stress the role of the media, as in the following example:

Sandra: *“Hard work, excellent work results, media appearance.”*

Although answers from this category suggest that the main responsibility for initiating the changes are with female scientists, we subsumed it under the macrosystem because it also addressed the overall social perceptions and the power of media in shaping social image.

In the end, we should mention that eight participants explicitly answered that their status as women is *“not distracted by the fact that they are women”* and that *“they don’t have any problems at work related to gender”*, so they could not provide any recommendation for their status improvement. There are three reasons for such claims – two of our participants stated that they worked in the sector where only women were employed, four stated that they worked in a very supportive environment and two explained that their problems at work stem mostly from the poor status of science in general and not from the fact that they are women – Ivana: *“I do not have problems in my environment as a woman in science. We all have problems as scientists in our country.”*

We expended the discussion on the main gender-related factors that would contribute to greater work satisfaction, by exploring the frequency and type of potential gender-based maltreatment. It was found that only 16% of the participants reported cases of discrimination because of their gender. Discrimination



implied less mentoring, more additional non-scientific work, getting worse assignments or being ignored because of their gender.

## Discussion and Conclusions

Since there were few studies (e.g. Bojanić 2014; Hodges 2017; Simić and Đorđević 2016) dealing with the professional experience and work satisfaction of Serbian women scientists, our aim was to further explore the work satisfaction of female scientists in Serbia, as well as gender-neutral and gender-related organizational, system and social factors that would contribute to their greater work satisfaction and possible cases of gender-based discrimination at the workplace. Therefore, we elaborated our findings in the light of Bronfenbrenner's ecological model and systematized recommendations for policy and practices change that will improve work satisfaction of women scientists (and scientist in general) in Serbia in line with this model (see Picture 2). We discovered that our participants are relatively satisfied with their work, mostly due to the nature of scientific work, which is perceived as intellectually stimulating and interesting. Findings presented in this paper emphasize the need for improvement of Serbian women scientists' status and satisfaction. Nine general work satisfaction improvement factors, classified within four Bronfenbrenner's layers of environment, were derived. Due to a position of Serbia as a semi-periphery country on a world scale and its longstanding economic stagnation, it is not surprising that most scientists mentioned structural barriers as one of the main causes of work dissatisfaction. The transformation effects are reflected within the exosystem, implying that the role of respective ministries, scientific committees and bodies, and other policy and decision makers, is of utmost importance for the improvement of scientists' work satisfaction in general, regardless of their gender. The most relevant issues are related to higher financial means – our participants would be more satisfied with their work if they had better technical resources and more staff employed at their work units (resulting in less workload), higher salaries, and more opportunities for financially supported professional development, which is in line with previous studies done in a Serbian context (Bojanić 2014; Cvetičanin and Petrović 2013; European Commission 2012; Simić and Đorđević 2016). These data support the assumption about the basic structural characteristics of the semi-periphery countries – that they lag behind the “core” countries (in the case of Serbia, at the beginning of the 21st century, this “core” is the EU). They also add to the idea that the “process of transformation on the semi-periphery affects, not only institutions, but gender regimes, as well” (Blagojević Hjuson 2012, 41,42).

Besides the expressed need for more investment into science, our participants stressed the need for more modern, industry oriented and socially relevant

projects. Our participants believe that this can be achieved through exchanges and cooperation with colleagues from other countries, and also through more rigorous and fair monitoring and evaluation of projects financed by respective Ministry. Additionally, our participants pointed to the need for establishing transparent, and fair system rules and procedures by respective Ministry, Universities and other relevant scientific bodies that should be equally applied to all individuals who are to be employed or promoted in academia, regardless of their status or age. These answers reflect our participants' perceptions of the high levels of discrimination (particularly, against younger researchers and scientists) and corruption, and consequently a lack of trust in academic institutions. Besides low levels of trust in Serbian government, justice system or police, detected in previous research (Golubović, Džunić, and Marinković 2014), low levels of trust in academic and scientific institutions can be an additional indicator of the ever-declining country's social capital.

Among most frequent general work satisfaction improvement factors, two are present at the micro- and meso-levels. Our finding that interpersonal relationships with both peers and superiors, and management quality contribute highly to work satisfaction, is consistent with findings from international and national research (Bojanić 2014; Cvetičanin and Petrović 2013; Fox 2010; Hill et al. 2010; Sabharwal and Corley 2009; Suresh 2006).

As for the gender-related work satisfaction improvement factors, six derived themes reflect the need for changes at all levels, in policies, values and practices. At the team and organization level, female scientists would like to see a change in colleagues' attitudes and treatment in the cases of harassment, and attitudes to their strivings to establish a balance between professional and family obligations, which has become an increasingly challenging issue in all post-socialist countries. Closely connected to these issues is their expectation from the exosystem to be better legally protected in cases of harassment at work and taking maternity leave. Finally, female scientists would be more satisfied with their work if they achieved higher levels of respect and equality in society in general, which is in line with findings from a study done with female scientists from one Serbian state University (Bojanić 2014). Some of them, though, adopted individualistic strategies, followed by the motto 'being better than them (males)' (Bagilhole 2007) and beliefs that change is possible only through personal, individual effort and not through the system. These findings correspond to the dominant patterns of the gender regime in the Serbian society, whose characteristics have been evolving "in a long historical period from pre-socialism, socialism, to post-socialism, during the transition from "traditional" to "modern" society" (Blagojević Hjuson 2012, 35). The dominant social position of women, according to the patriarchy, was the private realm of domestic life, therefore, during the long process of modernisation, women were forced to rely on their individual and informal strategies (Miletić – Stepanović 2005).

Every sixth participant reported experiencing gender-based discrimination at work. This constitutes fewer examples of discrimination compared to the findings from international studies, (Ceci and Williams 2011; House of Commons, Science and Technology Committee 2014; Settles et al. 2012; Sonnert and Fox 2012). It might be interpreted as a sign of a less significant presence of gender-based discriminatory practices at Serbian scientific institutions (at least, those covered by this research), or as a sign of a lack of sensitivity toward benevolent sexism. There are arguments for both interpretations, since our women are in their everyday life immersed into the interplay of two parallel value systems – those typical for socialism, when women participated fully (and, if nothing, declaratively equally) in the workforce, and patriarchal, traditional values (Petrović 2013; Stjepanović-Zaharijevski and Gavrilović 2010). However, if we look back at the findings from a qualitative study done with female teachers working at Serbian Criminal Police Academy, that they perceive it as “natural” to be in a subordinate position compared to men in such a “masculine” institution (Tomić 2010), or at the research on (institutional) denial in corporations (Vandevælde-Rougale 2017), we can presuppose that there are more grounds for our second interpretation.

Themes that refer to general work satisfaction improvement factors, especially those related to interpersonal relationships with colleagues and superiors, might involve certain gender-specific subthemes, but in most cases, they are not perceived as typical only for females. One of the reasons could be the fact some participants underlined, that they work in the single-sex teams, so they were not able to compare their position to that of male colleagues. Another reason might be the lack of comprehensive understanding of gender-based discrimination and tolerance toward practices like additional non-scientific work or exclusion from decision-making, due to patriarchal values that are widely adopted both by men and women (Lazić 2005, 2011; Petrović 2013). Finally, we can suppose that our participants are so dissatisfied with the status of science and scientists in Serbia in general, which some of them explicitly claimed, that the gender-specific factors of work dissatisfaction are perceived as a second-rate source of dissatisfaction.

From the results presented in this paper we can conclude that there is a high need for improvement of the position of scientists in Serbia in general, and female scientists in particular. In addition, there are indications that young researchers and scientist experience more discrimination at the workplace than their older counterparts. This should be investigated in more detail in future studies, and particular attention should be paid on young female researchers because they might be at high risk of double discrimination in academia.

If we strive to support female scientists’ professional development, their personal efforts need to be accompanied by changes in policies and practices,

starting from the microsystem (immediate work environment) to the exosystem (respective ministries and other state scientific bodies). Some of these changes require significant direct financial investments (e.g. employment of new staff, better working conditions and higher salaries), while others suggest changes in legal frameworks, organizational culture and wider public values and gender-roles expectations (see Picture 2).

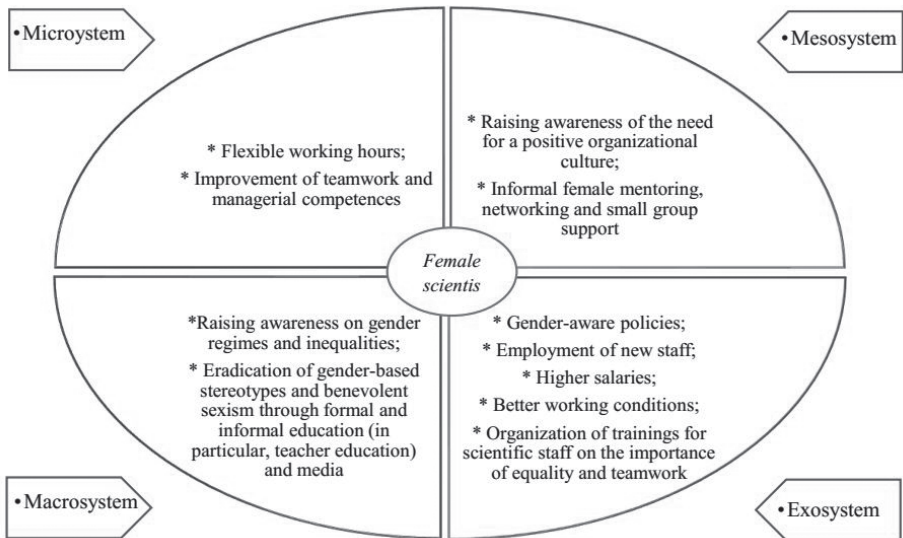
Although during times of social transformation and economic crises, changes in financial investments seem unfeasible, there have been some improvements in the sphere of legislation and policies – *Plan of action for the implementation of the national Strategy for improving and promoting gender equality 2010–2015* promotes a gender-aware scientific culture. Some of its strategic objectives are: (I) Equal access to education, balancing gender representation at all educational levels and profiles; (II) Building the capacities of the educational system by mainstreaming the gender perspective into education; (III) Eliminating gender inequalities in the education of groups discriminated on multiple grounds; (IV) Media promotion and campaigns for advancing gender equality, etc.<sup>5</sup> Besides that, in all policies related to education and employment (e.g. The Law on the Foundations of the Educational System or The Labour Law) any kind of discrimination is prohibited and equality is promoted. However, changes in practice – at the school, university and organization level, and social structures have been occurring much slower.

Having in mind the role of teachers in shaping students' motivation, competencies and self-esteem, it is necessary to raise teachers' awareness of gender issues during their pre-service and in-service training. It is also of utmost importance to eradicate gender-based stereotypes and to change value hierarchies that negate women's abilities and represent a basis for further inequalities in the sphere of work – limited access to "male" jobs and leading positions, lower salaries, etc. (Zaharijević 2008) through formal and informal education, and media. The critical stance toward patriarchal and traditionalist values implying strict gender role divisions and practices that reflect benevolent sexism, on one hand, and the promotion of values of equality and diversity among the wider public, on the other, would progressively contribute toward changes in organizational cultures. In addition, adult education specialists could contribute toward greater awareness of the need for a positive organizational culture and toward the improvement of teamwork and managerial competencies of the scientific staff through seminars and trainings that would be supported by higher-order scientific bodies. Having in mind that some female scientists adopt individualistic strategies that put excess pressure on them, especially on those who want to maintain a work-life balance, high risks of work dissatisfaction and burnout

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<sup>5</sup> For more, visit [http://www.gendernet.rs/files/dokumenta/Engleski/Serbian/Plan\\_of\\_Action\\_for\\_the\\_implementation\\_of\\_the\\_National\\_strategy.pdf](http://www.gendernet.rs/files/dokumenta/Engleski/Serbian/Plan_of_Action_for_the_implementation_of_the_National_strategy.pdf)

could be prevented by formal or informal female mentoring and networking or providing small group support. Additionally, introduction of flexible working hours could be particularly valuable for women who struggle with balancing between work and family obligations.



Picture 2. Recommendations for policy and practice change in relevant systems of the Bronfenbrenner's ecological model based on the research results

Finally, we should point to the limitations of this study and provide recommendations for designing future studies. Although the sample was diverse in terms of the participants' place of living, status and scientific discipline, the small number of participants prevents us from making strong generalizations, particularly generalizations regarding the scientists with more years of work experience. Even though our participants reported gender-neutral work satisfaction improvement factors, including male scientists as study participants would enable drawing more reliable conclusions about both gender-neutral and gender-specific work satisfaction improvement factors. Another limitation is related to the choice of data collection technique – in-depth interviews or focus groups would provide us with a better understanding of subtle subthemes that were only briefly addressed in this paper. However, this research can serve as a starting point for future studies (either large-scale quantitative or in-depth qualitative) on the subjective meanings and experience of female scientists in Serbia and build on previous studies on gendered science from other countries with a similar socio-political history.

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*Zadovoljstvo poslom naučnica u kontekstu  
postsocijalističke transformacije Srbije*

Ovaj članak proučava nivo zadovoljstva poslom koje obavljaju naučnice, kao i opšte i rodne faktore koji bi doprineli većem zadovoljstvu. Primenili smo interdisciplinarni pristup – koristili smo Bronfenbrennerov ekološki model (profesionalnog) razvoja, sociološku analizu konteksta i lingvističku analizu teksta. Stotinu srpskih naučnica popunilo je onlajn upitnik. One su izjavile da su umereno zadovoljne svojim poslom. Tematska analiza njihovih odgovora dala je devet opštih faktora poboljšanja zadovoljstva poslom: stvaranje pravičnog i efikasnog menadžmenta i poboljšanje odnosa sa nadređenima, poboljšanje socijalnih odnosa s osobama na istoj poziciji (Bronfenbrennerov mikro i mezo sistem); poboljšanje tehničkih resursa, povećanje plata, podrška stručnom usavršavanju, modernizacija i primena naučnog rada, unapređenje ljudskih resursa, uspostavljanje transparentnih, doslednih i poštenih sistemskih pravila (egzosistem) i borba protiv korupcije i nepotizma (makrosistem). Određeno je šest rodno povezanih faktora: prevazilaženje socijalnih prepreka vezanih za trudnoću i brigu o deci, promena stavova u slučajevima uznemiravanja (mikro i mezo sistem), prevazilaženje zakonskih prepreka vezanih za trudnoću i brigu o deci, promena u postupcima u slučajevima uznemiravanja (egzosistem), postizanje poštovanja

i jednakosti i promena društvene slike kroz lične napore (makrosistem). Preporuke za unapređenje politike i prakse razmatraju se u svetlu dominantnih vrednosti u kontekstu postsocijalističke transformacije Srbije.

*Ključne reči:* žene, nauka, zadovoljstvo poslom, postsocijalistička transformacija, Srbija, Bronfenbrennerov ekološki model

*La satisfaction professionnelle des scientifiques femmes dans le contexte de la transformation postsocialiste de la Serbie*

Cet article étudie le niveau de satisfaction professionnelle ressenti par les scientifiques femmes, ainsi que les facteurs généraux et genrés qui contribueraient à faire naître une satisfaction professionnelle accrue. Nous avons appliqué l'approche interdisciplinaire – nous avons utilisé le modèle écologique de développement (professionnel) de Bronfenbrenner, une analyse sociologique du contexte et une analyse linguistique du texte. Une centaine de chercheuses serbes ont rempli le questionnaire en ligne. Elles ont déclaré être modérément satisfaites de leur profession. L'analyse thématique de leurs réponses a fait ressortir neuf facteurs généraux d'augmentation de satisfaction professionnelle: la création d'un management juste et efficace et une amélioration des rapports avec les supérieurs, l'amélioration des rapports sociaux avec des personnes occupant la même position (le micro- et le méso-système de Bronfenbrenner), l'amélioration des ressources techniques, l'augmentation des salaires, le soutien au perfectionnement professionnel, la modernisation et la mise en pratique du travail scientifique, l'amélioration des ressources humaines, l'établissement des règles systémiques transparentes, conséquentes et justes (exosystème) et la lutte contre la corruption et le népotisme (macrosystème). Six facteurs liés au genre ont été relevés: le dépassement des obstacles sociaux liés à la grossesse et aux soins de l'enfant, un changement d'attitudes dans des cas de harcèlement (micro et méso système), le dépassement des obstacles juridiques liés à la grossesse et aux soins de l'enfant, un changement de procédures face à des cas d'harcèlement (exosystème), l'acquisition du respect et de l'égalité et un changement d'image sociale dû à des efforts personnels (macrosystème). Des recommandations pour le progrès de la politique et de la pratique sont discutées à la lumière des valeurs dominantes dans le contexte de la transformation postsocialiste de la Serbie.

*Mots clés:* femmes, science, satisfaction professionnelle, transformation postsocialiste, Serbie, modèle écologique de Bronfenbrenner

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