

Work locus of control as a mediator of the relationship between sources and consequences of occupational stress among university teachers

ANA SLIŠKOVIĆ, DARJA MASLIĆ SERŠIĆ and IRENA BURIC

The paper deals with the relationship between specific sources of occupational stress, work locus of control, attitudes towards work, and well-being of university teachers. Work locus of control is defined as a situational variable which includes the perception of the level of control and free decision-making in the working context (Williams & Cooper, 1998), and its mediating role in relation to the sources and consequence of occupational stress is assumed. Research was carried out using an on-line questionnaire on a sample of teaching staff employed at four of the largest universities in Croatia ($N = 1170$). The presences of particular sources of stress at work were measured by the Questionnaire of Exposure to Occupational Stress for University Teaching Staff (ISR-SN). Job and organization satisfaction, perceived psychological and physical well-being and work locus of control were measured by the Croatian version of Pressure Management Indicator. Results of path analyses confirmed the assumption of partial mediation effects of the work locus of control on the relationship between the sources and consequences of occupational stress in university teaching staff.

Key words: university teachers, occupational stress, work locus of control, work attitudes, well-being

Recent research on work well-being of academic staff in higher education does not support the traditional view of this profession. Unlike previous research which places university teachers on top of the list in terms of job satisfaction and well-being (see Sales & House, 1971), recent studies show a decreased psychological well-being in university teaching staff (Barkhuizen & Rothmann, 2008; Kinman & Jones, 2008b; Winefield et al., 2003), a higher level of burnout at work (Lackritz, 2004), the presence of various psychosomatic diseases (Blix, Cruise, Mitchell, & Blix, 1994; Gillespie, Walsh, Winefield, Dua, & Stough, 2001; Kinman, 1998), reduced job satisfaction (Kinman, 1998), a higher intention to leave the job (Barkhuizen & Rothmann, 2008; Gillespie et al., 2001; Kinman & Jones, 2008b), and reduced job performance (Barkhuizen & Rothmann, 2008; Jacobs, Tytherleigh, Webb, & Cooper, 2007; Parry et al., 2008). Disturbed well-being and reduced work motivation are the result of increased work pressures which university teachers are confronted with. Several authors have found that scientific and teaching staff are more exposed to occu-

pational stress than general staff, normative population and other highly-stressed occupational groups (such as doctors and managers), and also when compared to previous years (Barkhuizen & Rothmann, 2008; Catano et al., 2010; Doyle, 2003; Doyle & Hind, 1998; Gillespie et al., 2001; Kinman, 1998; Kinman & Jones, 2003, 2004; Tytherleigh, Webb, Cooper, & Ricketts, 2005; Winefield & Jarrett, 2001; Winefield et al., 2003).

These findings confirm the overall impression that the structure and working conditions of university teaching staff have changed significantly in recent years. The reason for this may be sought in the reforms in higher education which, among other things, result in an increased number of enrolments and a stronger connection between academic activities and the economy. For this reason the aim of most contemporary studies on occupational stress in university teachers was to identify the characteristic sources of pressure and/or determine the level of their consequences, usually in terms of work well-being and motivation. The most common sources of work-related stress are the following: unfavorable working conditions (Barkhuizen & Rothmann, 2008; Cownie, 2004; Gillespie et al., 2001; Kinman, 1998; Narayanan, Menon, & Spector, 1999), work overload (Barkhuizen & Routhmann, 2008; Gillespie et al., 2001; Kinman, 2001; Thorsen, 1996; Tytherleigh, 2003, Tytherleigh et al., 2005), and the conflict between work and family/social roles (Barkhuizen & Rothmann, 2008; Cownie, 2004; Kinman & Jones, 2008a, 2008b; Tytherleigh et al.,

Ana Slišković, Department of Psychology, University of Zadar, Obala kralja Petra Krešimira IV, 2, 23 000 Zadar, Croatia. E-mail: aslavic@unizd.hr (the address for correspondence);

Darja Maslić Seršić, Department of Psychology, Faculty of Humanities and Social Science, University of Zagreb;

Irena Burić, Department of Psychology, University of Zadar.

2005). As can be seen, these are universal pressures which are associated with experiencing occupational stress and they manifest themselves specifically in different jobs depending on the structure and working conditions.

Although the sources of pressure in university teaching staff have already been clearly described, and their consequences well investigated, there is a lack of research aimed at testing the theoretical models of the connection between the sources and the consequences of stress which would provide a deeper understanding of the changes in the working context of teaching and thus pave the way for organizational interventions in this ever more increasing area of human activity. The present study has been designed in this direction. It starts from general cognitive-interactional and transactional models of occupational stress and the centre of interest is the work control variable. Here, we examined *work locus of control* which Spector (1988) defines as a generalized belief about control over events in the workplace. Individuals who believe that their own behavior and/or certain personality traits lead to a specific event have an *internal locus of control* as opposed to individuals with an *external locus of control* who attribute outcomes to external factors such as chance, fate, "powerful" others, etc. People with an internal locus of control more often believe that a stressful situation can be controlled and therefore use coping strategies which are problem-focused, unlike people with an external locus of control who believe that it is impossible to change the situation (Ng, Sorensen, & Eby, 2006; Spector, 1982; Wickens & Hollands 2000). Ng et al. (2006) confirmed in a meta-analysis that internal locus of control was positively associated with measures of general well-being (psychological well-being, physical health, life satisfaction) and with affective reactions related to work (general job satisfaction, specific facets of job satisfaction, affective commitment, and intention to leave the job).

Analyzing the intervening variables in relation to sources and outcomes of stress, Koslowsky (1998) claims that certain variables in different contexts as well as various aspects of the same concept may have a different role—that of a mediator or moderator. Here, she gives an example of control in the work context, where the individual's objective control, which represents a stable individual trait, has the role of a moderator, whereas perceived control in the same context can have the role of a mediator. In the context of studying work stressors and potential outcomes of stress, the precondition in testing the mediation role of control is its association with the assessment of sources and outcomes of stress (Baron & Kenny, 1986). Given that work locus of control in our study is defined as a situational variable which implies the perceived level of control and freedom of decision making (Williams & Cooper, 1998), its mediating role in the relationship between sources and consequences of stress is assumed. Individuals react to high levels of particular sources of stress by experiencing a lack of control, and thus external locus of control is a variable which indirectly

leads to job and organization dissatisfaction and to negative effects on psychological and physical health. According to this, the aim of this study is set—to examine whether the relationship of specific sources of work stress with well-being and motivation in university teaching staff is mediated by work locus of control.

METHOD

Sample

The study included 1170 volunteer university teachers of all positions, which makes a return of 22% in relation to the targeted sample of teachers who were sent an invitation to participate in the study. Women comprise 57.26% of the obtained sample and in comparison with the target sample (in which women comprise 43.78%) were statistically far more represented than men ($\chi^2 = 74.67, p < .01$). The average age of teachers was 39.23 years ($SD = 11.47$), and the tenure at the university at which they were currently employed was 11.16 years ($SD = 9.90$). The largest part of the sample consisted of teachers employed at the University of Zagreb (58.21%), who were also the most numerous in the target sample (61.31%). Teachers at the University of Split and Osijek made 13.93% of the sample each, while teachers at the University of Rijeka made 13.25% of the sample. Compared to the target sample, there were no significant aberrations between the universities in which the teachers were employed. As for the academic titles, most of the sample consisted of assistant lecturers (51.37%), like in the target sample (45.59%) still with a statistically significant difference ($\chi^2 = 21.85, p < .01$). Assistant professors made 18.44% and associate professors 14.79% of the sample and both of these categories of staff had the same representation in the target sample. Full professors made 15.13% of the sample and their presence was statistically significantly lower ($\chi^2 = 8.75, p < .01$) than in the target sample.

Instruments

Questionnaire of Exposure to Occupational Stress for University Teaching Staff (ISR-SN) (Sliškočić, 2010) consists of 37 items which describe various sources of stress at work. Teachers made assessments to which extent each of the items was present in their job. The assessment was made on a six point scale and answer 1 meant *This isn't characteristic of my job at all*, while answer 6 meant *This is a distinct characteristic of my job*. The ISR-SN was developed on the basis of a qualitative and quantitative study conducted on a sample of Croatian university teaching staff, and measured six latent factors or sources of stress. The questionnaire showed satisfactory metric characteristics and Table 1 displays the basic descriptive data for each scale obtained in the study (M , SD , range, and Cronbach α). The questionnaire contains the following scales:

1. Material/technical Working Conditions scale comprises six items relating to unfavorable material and technical conditions for conducting research and teaching. Examples of items include: "Inability to purchase high-quality research equipment", "Inadequate technical equipment for teaching or research work".
2. The scale Students comprises six items related to the teaching work with students, their motivation and quality. Examples of items are: "Lack of interest and motivation in students", "Poor student achievement".
3. Interpersonal Relationships in the Workplace are a source of stress, which implies poor relationships with colleagues, and supervisors and/or mentor. This measure consists of eight items and some examples are: "Excessive power of supervisors in determining someone's career", "Lack of help and support from mentors".
4. Workload scale includes seven items measuring the workload at the faculty and the effects of the workload on social and family life. Examples of the items are: "General lack of time for scientific work", "Work-life imbalance".
5. Work Organization scale comprises seven items associated with inadequate work organization at the university or departments. Examples of questions are: "Excessive number of meetings", "Membership in too many various committees, commissions, councils, etc".
6. Social Working Conditions are a source of stress related to insufficient state funding of science. The scale consists of five items and examples are: "Need to publish in foreign languages", "Too low salaries in relation to other colleagues in the academic staff profession".

Job satisfaction, satisfaction with organization, psychological well-being, physical health and work locus of control were taken from the Croatian version of the Pressure Management Indicator (Williams & Cooper, 1998). Descriptive data for individual measures (M , SD , range, and Cronbach α) are shown in Table 1.

Job satisfaction was assessed on a six item scale. Respondents assessed their general job satisfaction and satisfaction with the degree to which they were motivated by the job; they also assessed the satisfaction with the content of tasks as well as the satisfaction with the degree to which the job provided them with an opportunity for personal development and suited their skills; they finally rated the satisfaction with the degree in which they feel fulfilled with work. The Scale of Satisfaction with the Organization consists of six items focusing on the satisfaction level with work organization and structure in the organization. When assessing organization satisfaction respondents rated their satisfaction with communication within the university at which they were employed, satisfaction with the style of supervision shown by their superiors, satisfaction with the way in which changes and innovations were introduced, satisfaction with the way of solving conflicts in the organi-

zation, and satisfaction with the organizational climate and structure. Both measures were assessed on a six-point scale where answer 1 meant *Complete dissatisfaction*, and answer 6 *Complete satisfaction*.

Psychological well-being was assessed with 12 items and answers were also given on a scale of 1–6. The level of worry, anxiety, and depression was assessed, and the individual's ability to overcome obstacles and problems. Examples of items are: "With regard to work and life in general, would you describe yourself as a person burdened with problems or as a worried person?"; "Are there moments during a normal workday when you feel nervous or upset without any obvious reason?". These items are scored reversely, because the higher total score on this scale reflected greater psychological well-being. Physical health was assessed on a seven-item scale, where the items embraced symptoms of physical tension or other unpleasant sensations and the level of energy and resilience of the individual. Items were evaluated according to the frequency of symptoms experienced by respondents in the last three months. A scale of 6 answers was used where answer 1 meant *Never* and answer 6 *Very often*. Examples of items are: "Unexplained fatigue or exhaustion", "Getting the stitch or sharp pain in the body".

Work Locus of Control scale measured the perception of control and the possibility of decision-making over events in the workplace. It consisted of eight items where teachers assessed the degree of agreement with each item on a scale from 1 to 6. Answer 1 meant *I don't agree at all*, and answer 6 meant *I agree completely*. Examples of items are: "I have little control over what happens at work", "I have little freedom in my job". The higher total score reflected a higher degree of internal orientation of work locus of control.

Data collection

The research was conducted in April/May/June 2009. Invitations to participate in the survey were sent by e-mail to all teachers in four Croatian universities who had their emails on the web sites of the universities where they worked. The participation in the survey was voluntary and was based on completing an on-line questionnaire taking 20-25 minutes. It was explained to the teachers that their identity would be protected and the provided data would be used solely for research purposes. They were given an opportunity for additional explanations by the researchers via e-mail. The questionnaire was on the web for six weeks, and after the first invitation for participation, three more reminders were sent by e-mail during this period.

Data analysis

Path analysis was used to test the mediating role of work locus control in the relationship of various sources of

stress and variables of job and organization satisfaction, as well as the psychological well-being and physical health. Analyses were conducted using Mplus 5.21 statistical program (Muthen & Muthen, 2009). Sources of stress (material/technical working conditions, work with students, interpersonal relationships, workload, work organization, and social conditions) had the status of independent variables, work locus of control had the status of a mediation variable, and job and organization satisfaction as well as psychological well-being and physical health represented dependent variables. It was hypothesized that work locus of control partially mediates the relationships between sources of stress and outcome variables – sources of stress affect job and organization satisfaction as well as psychological well-being and physical health both directly and indirectly through work locus of control.

In order to maintain parsimony, two separate models were tested: (a) a partial mediation model of work locus of control in the relationship of various sources of stress with job and organization satisfaction, and (b) a partial mediation model of work locus of control in the relationship of various sources of stress with psychological well-being and physical health. In the first step, both partial mediation models were fitted to the one half of the sample data. Since in this way presumed models of partial mediation are just identified (i.e., they have zero degrees of freedom), it made it impossible to test the total model fit. Thus, in the second step of the analysis, the models were respecified by eliminating statistically insignificant paths (i.e., fixing those parameters to zero) and also fitted to another half of the sample data. This enabled the overidentification of the models (i.e., positive number of degrees of freedom), the calculation of their fit indices, and making more firm conclusions.

The evaluation of the parameters in the model was made using the maximum likelihood algorithm. Full information maximum likelihood procedures were employed to compensate the missing data. Matrix of raw data served as an

input matrix. As indicators of the model fit the following measures were used: Chi-square test, CFI (Comparative Fit Index), TLI (Tucker-Lewis Index), RMSEA (Root Mean Square Error of Approximation) and SRMR (Standardized Root Mean Square Residual). Cut-off values of CFI and TLI greater than .90 and RMSEA and SRMR values lower than .10 indicate an acceptable, while CFI and TLI above .95 and RMSEA and SRMR up to .05 indicate a good fit between the model and the obtained data. Statistical insignificance of χ^2 test, as well as the ratio of Chi-square and the degrees of freedom that fall below 3, are indicators of an excellent model fit (Hu & Bentler, 1999).

RESULTS

Table 1 shows Pearson coefficients of bivariate correlation between the observed variables. All intercorrelations were statistically significant at $p < .01$. The assessments of the sources of stress are in low to moderately negative correlations with the measures of satisfaction and psychological well-being and physical health (from $r = -.16$ to $r = -.60$). The correlations between work locus of control and perceived sources of stress ranged from low to moderate (from $r = -.25$ to $r = -.50$). The correlations between work locus of control and measures of satisfaction and psychological well-being and physical health were positive and moderate and ranged from $r = .36$ to $r = .53$.

On the basis of obtained fit statistics, it can be concluded that the model with job and organization satisfaction as dependent variables fits the following data very well in both halves of the sample: 1) $\chi^2 = 4.74$, $df = 4$, $p = .31$, $\chi^2/df = 1.18$, CFI = .99, TLI = .99, RMSEA = .018 [.000, .067], SRMR = .012; and 2) $\chi^2 = 6.61$, $df = 4$, $p = .36$, $\chi^2/df = 1.65$, CFI = .99, TLI = .99, RMSEA = .013 (90% CI [.000, .057]), SRMR = .012. A similar finding was also obtained for the model with psychological well-being and physical health as dependent variables: 1) $\chi^2 = 6.72$, $df = 4$, $p = .15$,

Table 1
Descriptive data and intercorrelations of variables ($N = 1170$)

	<i>M</i>	<i>SD</i>	Range	Cronbach α	2	3	4	5	6	7	8	9	10	11
1. Material/technical conditions	22.50	7.71	6-36	.89	.25	.45	.39	.48	.51	-.27	-.33	-.19	-.24	-.31
2. Students	20.38	6.02	6-36	.82		.26	.30	.31	.29	-.21	-.18	-.26	-.22	-.25
3. Interpersonal relationships	27.02	9.43	8-48	.88			.43	.47	.39	-.51	-.60	-.34	-.33	-.50
4. Workload	28.19	7.09	7-42	.86				.45	.45	-.29	-.25	-.41	-.45	-.34
5. Work organization	16.79	5.45	5-30	.75					.45	-.26	-.47	-.20	-.25	-.25
6. Social conditions	22.14	4.60	5-30	.65						-.19	-.29	-.16	-.23	-.25
7. Job satisfaction	25.41	5.48	6-36	.89							.51	.40	.32	.53
8. Organization satisfaction	18.66	6.14	6-36	.88								.25	.24	.41
9. Psychological well-being	44.29	10.14	13-71	.85									.65	.47
10. Physical health	27.38	7.80	7-42	.86										.36
11. Work locus of control	28.29	5.43	8-45	.75										

Note. All correlation coefficients are significant at $p < .01$.

$\chi^2/df = 1.68$, CFI = .99, TLI = .99, RMSEA = .023 [.000, .078], SRMR = .015; and 2) $\chi^2 = 5.28$, $df = 4$, $p = .26$, $\chi^2/df = 1.32$, CFI = .99, TLI = .99, RMSEA = .023 (90% CI [.000, .070]), SRMR = .011. Also, the path coefficients were very similar in magnitude in both halves of the sample. Thus, only the results of the first half of the sample were shown. Having examined the values of standardized path coefficients (STDYX standardization method was applied to obtain the model coefficients), it can be concluded that most effects were small to medium (Figure 1 and Figure 2). The percentage of the explained variance of work locus of control in particular sources of stress in both models was 28%. In addition, sources of stress directly or indirectly, through the work locus of control, explained 33% of the job satisfaction variance, 41% of the organization satisfaction variance, 37% of the psychological well-being variance and 29% of the physical health variance.

The path analysis with the job and organization satisfaction as dependent variables confirmed the negative effects of the sources of stress related to work with students ($\beta = -.12$, $Est/S.E. = -3.26$, $p < .01$), interpersonal relationships ($\beta = -.41$, $Est/S.E. = -11.73$, $p < .01$), and workload ($\beta = -.13$, $Est/S.E. = -3.15$, $p < .01$) on the perceived level of work locus of control. The path coefficients representing the influence of work locus of control on job and organization

satisfaction were positive ($\beta = .31$, $Est/S.E. = 8.04$, $p < .01$ for job satisfaction and $\beta = .15$, $Est/S.E. = 4.11$, $p < .01$ for organization satisfaction). Furthermore, pressures related to the relationship with students, interpersonal relationships, and workload affected indirectly the measures of job and organization satisfaction via perceived work locus of control. Unsatisfactory interpersonal relationships and relationships with students had a direct negative effects on job satisfaction ($\beta = -.29$, $Est/S.E. = -7.52$, $p < .01$ and $\beta = -.13$, $Est/S.E. = -3.70$, $p < .01$, respectively). Interpersonal relationships also had negative effect on organization satisfaction ($\beta = -.46$, $Est/S.E. = -11.94$, $p < .01$), while for the workload a positive influence on organization satisfaction was found ($\beta = .15$, $Est/S.E. = 4.26$, $p < .01$). Given the negative correlation between workload and organization satisfaction (Table 1) this analysis reported a net suppression (Kline, 2005; Krus & Wilkinson, 1986). Additional regression analyses (not shown here) showed that sources of stress related to interpersonal relationships and work organization removed the irrelevant part of the workload variance, which made the workload a positive predictor of organization satisfaction. This means that the teachers' dissatisfaction with their university is not determined by a heavy workload. Moreover, with good interpersonal relationships and a proper work organization at the university, workload is the factor which

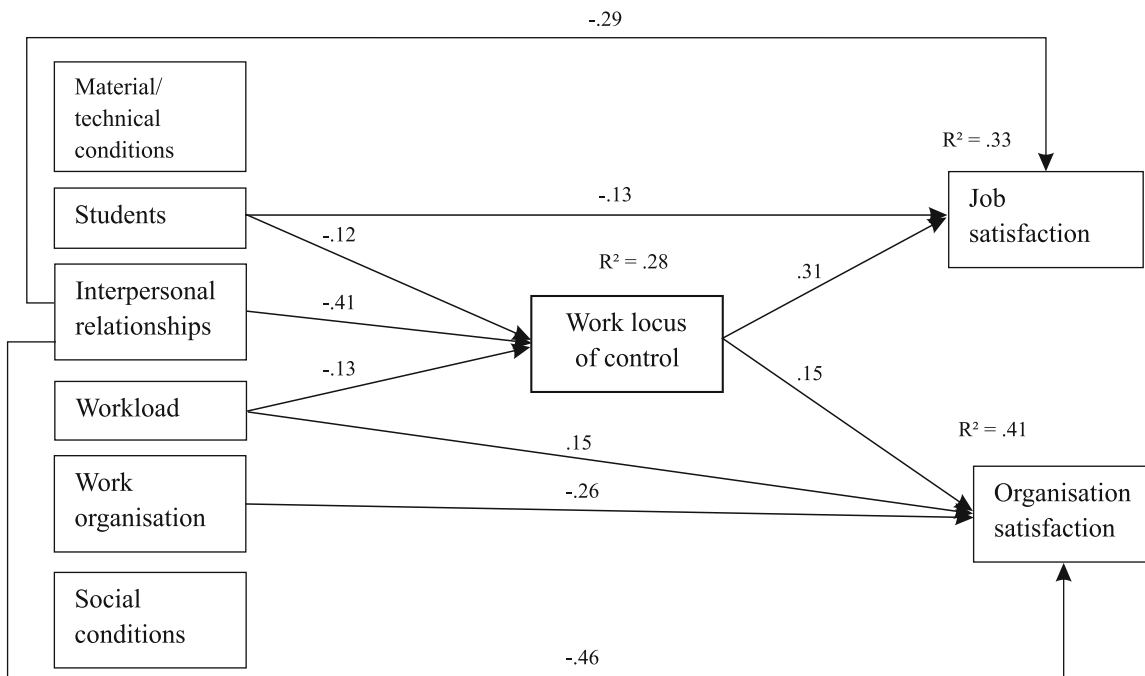


Figure 1. Final path analytic model for job and organization satisfaction as outcome variables. Sources of stress (material/technical conditions, students, interpersonal relationships, workload, work organization, social conditions) have the status of independent variables, and work locus of control has the status of a mediation variable. Only statistically significant standardized path coefficients are shown ($p < .05$). Correlation coefficients among the exogenous variables and disturbance terms are not presented for clarity. R^2 = proportion of explained variance.

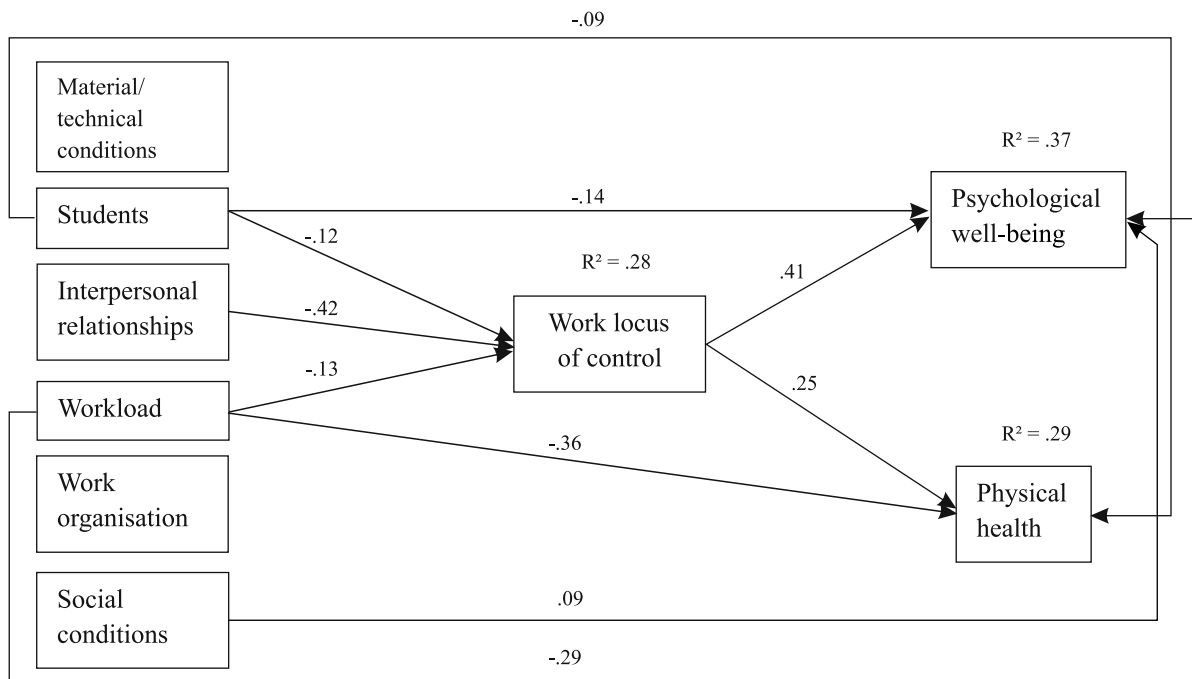


Figure 2. Final path analytic model for psychological well-being and physical health as outcome variables. Sources of stress (material/technical conditions, students, interpersonal relationships, workload, work organization, social conditions) have the status of independent variables, and work locus of control has the status of a mediation variable. Only statistically significant standardized path coefficients are shown ($p < .05$). Correlation coefficients among the exogenous variables and disturbance terms are not presented for clarity. R^2 = proportion of explained variance.

contributes to higher levels of satisfaction with the university at which teachers are employed.

The result of path analysis pointed to a direct negative effect of work organization on the organization satisfaction ($\beta = -.26, p < .01$). Contrary to expectation, the source of stress related to social conditions was not correlated with the work locus of control and dependent variables. Given the significant bivariate correlations between the unsatisfactory social conditions and the measures of satisfaction, the explanation of such a finding probably lies in the connection of other sources of stress, primarily those of workload and work organization, with social conditions (Table 1). These variables probably eliminated the irrelevant part of the variance of pressures related to the social conditions.

The path analysis with the psychological well-being and physical health as dependent variables, also found negative effects of the following sources of stress on the perceived level of work locus of control: work with students ($\beta = -.12, \text{Est}/\text{S.E.} = -3.31, p < .01$), interpersonal relationships ($\beta = -.42, \text{Est}/\text{S.E.} = -11.21, p < .01$), and workload ($\beta = -.13, \text{Est}/\text{S.E.} = -3.20, p < .01$). On the other hand, a more internal locus of control had positive effects on the psychological well-being ($\beta = .41, \text{Est}/\text{S.E.} = 11.92, p < .01$) and physical health ($\beta = .25, \text{Est}/\text{S.E.} = 6.57, p < .01$). The psychological well-being, along with indirect influences through the

work locus of control, was directly affected by the independent variables of work with students ($\beta = -.14, \text{Est}/\text{S.E.} = -3.67, p < .01$) and workload ($\beta = -.29, \text{Est}/\text{S.E.} = -7.94, p < .01$). Moreover, it was confirmed that social conditions had a direct effect only on the psychological well-being ($\beta = -.09, \text{Est}/\text{S.E.} = 2.58, p < .01$). Finally, relationships with students and workload had both indirect (through the work locus of control) and direct effects on physical health ($\beta = -.09, \text{Est}/\text{S.E.} = -2.24, p < .05$ and $\beta = -.36, \text{Est}/\text{S.E.} = -10.03, p < .01$; respectively). Contrary to expectations, neither indirect nor direct influence of the work organization variable on the psychological well-being and physical health was found. The finding is attributed to the connection with other sources of stress (Table 1).

It should be pointed out that all sources of stress, except for the social conditions, had negative effects on the dependent variables. The positive sign before the standardized coefficient of the social conditions path variable ($\beta = .09, p < .01$) is a result of a net suppression. Additional regression analyses (not shown here) showed that the variables of workload and work organization, which most highly correlated with the variable of social conditions (Table 1), had eliminated the irrelevant part of variance of this variable. Thereby, social conditions, whose bivariate correlation with the measures of psychological well-being and physical health

was negative, became a positive predictor. It is not unimportant to mention that the measure of this source of stress has a somewhat lower reliability of the type of internal consistency ($\alpha = .65$), and a review of the items of this factor revealed one which the respondents of focus-groups in our qualitative study reported as negative, but which may also be stimulating ("Need to publish in a foreign language"). It is possible that this item was linked to the remaining part of the "positive" variance of this source of stress.

DISCUSSION

The obtained results are in accordance with the assumed hypothesis of the partial mediation of work locus of control in relation to the sources of stress and job and organization satisfaction as well as the sources of stress and psychological well-being and physical health of university teachers. Data analysis showed only two exclusively direct contributions of the sources of stress to the presumed consequences of stress. Namely, it was found that the experience of pressure due to poor work organization only directly contributed to the dissatisfaction with the university of the employees. Given that the variable of organization satisfaction was determined as an additive function of satisfaction with a number of aspects of work organization, such as, for example, satisfaction with organizational structure and communication or style of leadership, it could be expected that the organization satisfaction would be primarily determined by the source of stress which related to the work organization in the university itself. In addition, social conditions of work only directly contributed to the psychological well-being of the university teachers.

Contribution of the most of the examined sources of occupational stress to the explanation of the consequences of stress was completely or partly mediated by the level of the work locus of control. Perception of unfavorable interpersonal relationships, besides its direct contribution to the levels of job and organization satisfaction, also had an indirect effect on the all researched consequences of stress, through the work locus of control. Poor interpersonal relationships were recognized and put into the category of general stress which represented a threat to satisfaction and general psycho-physical well-being of individuals in the work organization (Cartwright & Cooper, 1996), so that university teachers do not differ in this aspect from workers in other organizations. The results of the research, however, suggest that the connection of poor interpersonal relationships at work with satisfaction and psycho-physical well-being can be explained by the perception of a lack of control and the impossibility of decision-making in a work context. Content-wise, this source of stress is underlain to a larger extent by the poor relationships with superiors and/or mentors and to a lesser extent with colleagues. For example, the item which showed the largest factor of saturation was "Excessive power of superiors in determining one's career". In this

sense, the variable of interpersonal relationships at university is determined by the hierarchical system of power. So the presence of this kind of stressor can have an effect on the work locus of control, which indirectly leads to negative outcomes.

In the research carried out direct negative effects of workload were confirmed on both measures of psycho-physical well-being (O'Driscoll & Cooper, 2002). However, this relationship is partly mediated by the perception of control and the possibility of decision making in a work context. When, however, we speak of job satisfaction, the effects of workload are mediated by the level of work locus of control. This means that the perception itself of workload is not a factor which determines job satisfaction, but rather the relationship of workload and job satisfaction depends on the perception of control and the possibility of decision-making within the work context. Moreover, along with the control of other sources of stress, workload becomes a factor which contributes to the higher levels of satisfaction with the university where the teachers are employed. Pressures connected with the work with students have a direct effect on the psychological well-being, physical health and work satisfaction, but the effects on organization satisfaction are completely mediated by the level of the work locus of control. Although material/technical conditions negatively correlated with all examined stress outcomes, which is in accordance with results of the previous research (e.g., Leung, Siu, & Spector, 2000), contributions of material/technical conditions to the job and organization satisfaction and the psycho-physical well-being of teachers were not significant in the obtained study.

The obtained results showed that the relationship between sources and outcomes of occupational stress is mediated by work locus of control defined as a situational variable which is directly influenced by pressures at work. There are a number of studies which point at a possible mediating role of perceived control in the relationship between sources and outcomes of stress in other areas, e.g., in negative outcomes of refugeeism (Kim, 2002), the relationship between stressors and depression in adolescents in poor urban areas (Deadorff, Gonzales, & Sandler, 2003), the relationship between the loss of manifesting and latent functions of employment and well-being (Creed & Bartrum, 2008). Akin to this research, the above mentioned studies are also correlational, which limits the possibility of making conclusions about the causal relationships. However, the obtained results are in accordance with the theoretical assumption that frequent exposure to intensive uncontrolled stressors leads to the expectation that no kind of behavior which an individual has at his disposal can have an influence on future events, that is, it provokes experience of external control which is connected with inadequate ways of coping. The negative outcomes of stress, according to the mediating model of control in a working context are mediated by dysfunctional causal attributions and the experience of the loss of

control which is conditioned by the stressfulness of the situation itself.

In the perception of one's own control in the working context, an individual will choose the most effective way of coping with a stressful situation, while in a situation of perceived impossibility of control, the individual does not see the possibility of taking a constructive action himself, so that he will passively cope with stressors at work (Koslowsky, 1998; Spector, 2000). In the research carried out coping with sources of stress was not examined. However, the results obtained show that the relationship between the sources and outcomes of stress in a large extent can be explained by the level of the work locus control, i.e., by the perception of control and the freedom of decision-making at work. However, this direction of acting is not the only possibility. Given that using correlational design it is not possible to confirm the cause-and-effect connection between the potential sources of stress, work locus of control and the consequences of stress, there are alternative explanations of the established connections. So it is possible that teachers with an external work locus of control perceive higher potential sources of stress, which eventually leads to effects on their satisfaction and psycho-physical health. Besides this, it is also possible that the perception of the stressfulness of a situation is more prominent in less satisfied teachers with unsatisfactory psycho-physical status. This is where the basic limitations of the research carried out lies. However, since the work locus of control in the research is operationalised as a situational variable, or as the perception of the level of control and free decision-making in a work context, the obtained mediation effects are consistent with the theoretical models and empirical results in the area of stress (e.g., Creed & Bartrum, 2008; Deadorff et al., 2003; Kim, 2002; Koslowsky, 1998).

The key mediating variable in all interactive and transactional models of stress is the perception or appraisal of the stressfulness of a situation (Cooper, Sloan, & Williams, 1988; Cooper & Baglioni, 1988; Lazarus & Folkman, 2004; Sulsky & Smith, 2005). In the research carried out the measures of sources of stress were operationalised as the presence of potential sources of stress at work. The teachers assessed the extent to which a certain aspect of work was present in their work, and not its stressfulness. We, therefore, believe that the perceived control in this context acts as an "intermediate stage" of the controllability assessment of working conditions. It also directs the way of coping, and determines the effects on satisfaction and psycho-physical well-being. In accordance with this, the obtained results about the complete or mediating role of the work locus of control in the relationship between particular sources and consequences of stress support the hypothesis of perceived control in a work context as a mediating variable. For its final confirmation a longitudinal approach is needed. In addition, when talking about the impact of a particular stress source on the measured outcomes, it is necessary to pay

attention on our sample bias that limits the external validity of the results. Women and teachers at lower positions (assistants) were significantly more represented and men and teachers at the highest position (full professors) significantly less represented in comparison with the target sample. These could serve in favor of observed relevance of some specific stressors, as well as the perceived work control, in accounting for the individual differences in work-related well-being among university teachers. Namely, results of our earlier studies in the same sample showed that women and teachers in lower positions report greater levels of stress at work (see Slišković & Maslić Seršić, 2011). Besides, further research should focus on the development of objective measures of the sources of stress in the working environment of university teachers in order to determine their real connection with the perception of control and outcomes of stress. Given the multidimensional nature of control (see e.g., Frese, 1989; Ganster, 1989), it is recommended to develop control measures which would be compatible with stressors in the work environment. In this way indicators of the controllability of particular sources of stress would be provided. Since there is a possibility of differences in the mechanisms of certain aspects of control, primarily the objective and perceived ones (Koslowsky, 1998), further investigations should also focus on the objective measures of control, which in university teachers may be operationalised through their academic position.

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