

THEORETICAL ASSUMPTIONS AND PSYCHOMETRIC CHARACTERISTICS OF THE SENSE OF PERSONAL CONTROL AT WORK QUESTIONNAIRE

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Abstract. Personal control is a very important determinant of stress experienced at work. This variable is taken into account in different models of stress, and its role in the relationship between stress and stress effects has been studied in many research projects. But there is still lack of in-depth theoretical considerations on various definitions of control, which would allow to develop precise operationalization of this phenomenon.

The following issues are discussed in this paper: 1) theoretical assumptions important for proper construction of the Sense of Personal Control at Work (SPCW); 2) the origins of SPCW Questionnaire; 3) the results of empirical study on psychometric characteristics of the SPCW Questionnaire.

A group of 160 subjects participated in the study; the SPCW Questionnaire was administered twice with a 2-week interval; at the first stage, it was used together with other instruments, such as Maslach Burnout Inventory, Stress at Work Questionnaire, Work Satisfaction Scale, general Health Questionnaire-28.

Reliability coefficients: Cronbach $\alpha = 0.81$; $r_{tt} = 0.69$. Validity: correlation coefficients between personal control and work satisfaction $r = 0.44$; stress at work $r = -0.33$; emotional exhaustion $r = -0.28$; personal accomplishment $r = 0.25$; depersonalisation $r = -0.26$; mental health $r = -0.19$. Exploratory factors analysis have not confirmed theoretical structure of the SPCW Questionnaire.

Key words:

Sense of personal control, Occupational stress, Mental health

INTRODUCTION

The concept of control is recognised as a very important element of the research on work conditions and their impact on stress perception and well-being of employees. The control construct has been used in different areas of organizational research, including participation in decision making, job redesign, goal-setting, and occupational stress [1,2,3]. There is no single view on the control construct that would be common to all researchers in the

areas of occupational and organisational psychology. In the literature, it is possible to identify three approaches to defining control in the workplace:

- 1) control as an objective characteristic of work situation which allows opportunities for exerting an influence [4];
- 2) control as a stable personality trait concerning generalized beliefs about the extent to which important aspects of life/work situation are controllable (e.g. locus of control, manageability) [5,6]; and

This study was carried out as a part of the Strategic Governmental Program on Health Protection and Safety at Work and supported by funds from the State Committee for Scientific Research (grant SPR 04.10.34), Chief Co-ordinator: Central Institute for Labour Protection.

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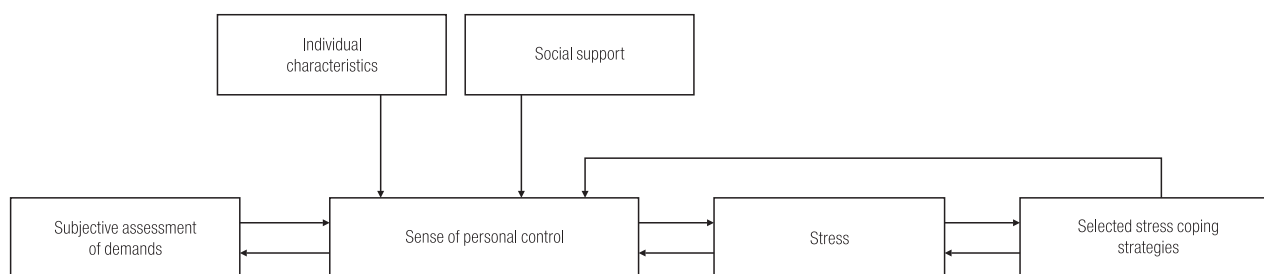


Fig. 1. Factors determining the sense of personal control.

3) control as a subjective evaluation reflecting an individual's judgement about the extent to which his/her work situation is amenable to control. This kind of control may be termed a sense of personal control in the actual situation [3]. The aim of this paper is to present the instrument resulting from the operationalization of the control construct, following the third approach. The instrument has been named the Sense of Personal Control at Work (SPCW) Questionnaire.

PRELIMINARY ASSUMPTIONS AND FORMAL STRUCTURE OF THE QUESTIONNAIRE

When constructing the questionnaire a number of assumptions have been made. Firstly, the questionnaire should be designed to measure one's sense of personal control, a cognitive structure that is acquired by an individual in association with the experience gained when exercising control over a situation of a given class. It determines individual beliefs whether he/she feels threatened or safe, whether the situation is perceived as difficult but possible to cope with, or whether it is easy to control. Such individual sense of personal control is a resultant of one's stable individual characteristics, assessment of demands and received support, and it determines the level of arousal of the autonomic nervous system (Fig. 1).

Secondly, the questionnaire items should concern the essential dimensions of the sense of personal control. An individual may be said to have the sense of personal control when he/she:

- perceives the causal relationship between own activities and the events affecting him/her;
- can predict, in general, the course of events;

- is convinced that thanks to his/her own action he/she is able to reach his/her goals. (If a worker is convinced that these three conditions are met, he/she is able to recognise a relationship between his/her action and different outcomes. This is operationalized in the questionnaire as Relationship - first dimension of personal control;
- is aware that he/she can choose and determine the aims and directions of own activities: Competence – the second dimension;
- has a free choice of the means and strategies he/she can employ to achieve the goal: Freedom – the third dimension.

If all of these criteria are satisfied, the individual has a strong sense of personal control over the events [7].

Thirdly, the extent of the control perceived may vary, depending on the situation, e.g. we may feel a strong sense of personal control over some aspects of our private life, but at the same time believe that we have no control over the situation at work. Thus, the questionnaire items should refer only to a specific category of situations. Since our task was to develop a questionnaire to measure the perception of personal control in the occupational context, the questions should appeal to one's own experience related to the occupation and work performance. They should also refer to particular work characteristics, but at the same time be universal enough for representatives of different occupations.

When analyzing the most popular questionnaires used for the measurement of the control construct we realized that none of them fully complies with the assumptions we have made beforehand. The instrument developed by Karasek [8,9] is based on the assessment of job (work) characteristics

which may enhance the sense of personal control. This refers particularly to the situation when an expert opinion is a base for assessing control in the occupational context. Moreover, Karasek's questionnaire does not satisfy the second of our assumptions i.e. the definition of control perception.

Two other questionnaires applicable to the assessment of personal control, designed by Rotter [5] and Spector [10] are concerned with the concept of the locus of control, which is inconsistent with the sense of personal control as defined in our preliminary assumptions.

Also Bryant's questionnaire, although based on a very interesting concept and theoretical background, does not comply with most of our assumptions. Contrary to our definition of control perception, it is designed to measure a relatively stable and general personality trait, it does not refer to the occupational context and does not contain the basic components of the definition of control perception [11].

As none of the considered questionnaires met the requirements laid down by us at the very beginning, we decided to construct a new measuring tool that could be used for the assessment of sense of personal control with respect to the occupational setting. We have assumed that the questions should elicit information whether a given worker (a) perceives a causal relationship between his/her behavior and the outcomes of work performance (Relationship dimension); (b) is free to choose the tasks and activities that may enhance work performance and improve its outcomes (Freedom dimension); and (c) what is his/her assessment of own professional skills and competence (Competence dimension).

Following Ganster's suggestion [12], we have made an assumption that the sense of personal control may differ between workers, depending on a given aspect of work condition the control refers to. After some modification of his conception we decided to include in our questionnaire the items dealing with the following six aspects of control in the workplace: 1) quantity and quality of work tasks; 2) work pacing; 3) influence on co-workers; 4) influence on superiors, 5) work procedures; and 6) work scheduling. To make an assessment of the sense of personal control in the workplace, the inquired workers should respond: (a) whether they can perceive for each of the

domains a relationship between their own activity and the outcomes; (b) whether they are free to participate in shaping particular aspects of work conditions; and (c) whether they feel they have relevant competence to perform their work tasks.

The six domains of work and three dimensions of control make 18 possible combinations, which indicate that the questionnaire should comprise just this number of items. Table 1 presents the formal structure of the questionnaire. The number in each cell marks a respective questionnaire item. Each item is accompanied by a five-point scale. The questions in each column constitute particular dimension of the sense of personal control, making up three scales: Relationship, Freedom and Competence. The interviewed worker is said to have a complete sense of personal control if he has scored high on each scale. Then we can interpret the results quantitatively by reading the total score, and qualitatively by comparing the score for each scale. We can say that the sense of personal control is either balanced, if the scores for each scale are similar in value, or unbalanced, if the score for one scale differs significantly from the others. The questionnaire items translated into English are presented in the Annex.

THE PSYCHOMETRIC PARAMETERS OF SPCW QUESTIONNAIRE

In order to analyze the psychometric characteristics of the questionnaire, the instrument was included in the test battery used in a project on occupational stress among police officers. The subjects were 160 policemen attending a

Table 1. The formal structure of the questionnaire to measure the sense of personal control at work

Dimension of control perception Aspect of work	Scales		
	Relationship	Freedom	Competence
Quantity/quality of work tasks	1	2	3
Work pacing	4	5	6
Influence on co-workers	7	9	11
Influence on superiors	8	10	12
Work performance	13	14	15
Work scheduling	16	17	18

Table 2. Study group characteristics

Characteristics	Mean	Standard deviation
Age	32.0	5.7
Work duration (year)	9.6	5.9
Education:	N	%
secondary	152	96.2
less than university	4	2.5
university	2	1.3
Sex:		
male	153	96.2
female	6	3.8

training course in a police training center. The tests were anonymous. The control perception questionnaire was completed twice, with an interval of one to two weeks. The characteristics of the study group is presented in Table 2. The subjects were mostly males; the mean age of the group was 32 years and the mean duration of work 9.6 years. Secondary education prevailed among the subjects.

Analysis of questionnaire items and scales

The discrimination power of the items, presented in Table 3, was verified by determining the level of correlation between each questionnaire item and its scale or the total

score. A high correlation of the item with its scale, a low correlation with the total score and very low (or no) correlation with the other scales indicate a high discrimination power of the item under the study [13]. The analysis of the results summarized in Table 3 makes it possible to draw two conclusions. 1. All the items correlate highly with the scales they belong to (marked with grey background). There is a slight difference in the correlation with the overall score. These findings reflect a high discrimination power of the questionnaire items. 2. All the items demonstrated a lower but statistically significant correlation with the scales which they do not refer to. This finding weakens somewhat the discrimination power of the items but does not exclude any of them. Especially, the correlation coefficients between scales were rather high and ranged from 0.54 to 0.67. This is clear evidence that the scales of the questionnaire are not independent.

Reliability and validity of SPCW Questionnaire scales and total score

The reliability of the SPCW Questionnaire scale and of the total score on this test was assessed using two methods: 1) the test-retest method, which allows determining

Table 3. Analysis of discrimination power of SPCW Questionnaire items

Item no.	Relationship	Scales		
		Freedom	Competence	Total score
1	0.52	0.21	0.27	0.40
2	0.41	0.52	0.38	0.52
3	0.15	0.13	0.60	0.33
4	0.56	0.30	0.30	0.46
5	0.33	0.61	0.33	0.51
6	0.40	0.40	0.60	0.55
7	0.63	0.26	0.20	0.44
8	0.52	0.33	0.22	0.43
9	0.24	0.52	0.25	0.41
10	0.23	0.53	0.34	0.44
11	0.43	0.39	0.51	0.52
12	0.34	0.31	0.42	0.42
13	0.69	0.49	0.45	0.65
14	0.34	0.74	0.37	0.59
15	0.17	0.25	0.51	0.36
16	0.60	0.38	0.44	0.56
17	0.46	0.69	0.36	0.61
18	0.28	0.35	0.57	0.47

Table 4. Reliability of SPCW Questionnaire scales and total score

Scales	r_{tt}	Cronbach α
Relationship	0.61	0.62
Freedom	0.70	0.66
Competence	0.42	0.50
Total score	0.69	0.81

the stability of results; and 2) Cronbach α test for homogeneity of the questionnaire. The data displayed in Table 4 indicate that the reliability coefficients are not very high. Particularly low stability was found for the Competence scale ($r_{tt} = 0.42$). The stability index would have been much higher than the obtained value of 0.69 if the questionnaire had been limited to only two scales: Relationship and Freedom. The homogeneity coefficient of the total score was satisfactory.

Considering the reliability of SPCW Questionnaire in general, one may note that it is not much different from respective findings for personality inventories commonly applied in psychological testing [14].

The assessment of validity of an instrument is an essential task for its authors. It requires the performance of a number of tests that will make it possible to evaluate different kinds of validity [13]. At the present stage of work on SPCW Questionnaire, the content and construct validity were assessed. The former is ensured by the very procedure of constructing the questionnaire. The formulation of questionnaire items was dependent on the adopted definition of the sense of personal control. Prior to this task, a formal model of the control construct was developed based on fundamentals of the definition and primary areas that the exertion of control in workplace can refer to (Table 1).

When assessing the construct validity of the questionnaire the following assumptions were formulated: 1) individuals with a strong sense of personal control in the occupational context should experience less work-related stress than the persons characterized by low perception of personal control. Therefore, a negative correlation between the sense of personal control and stress was expected. 2) It was supposed to find a positive correlation between the sense of personal control and job satisfaction. The need to have

control over a given situation is common to all humans and the satisfaction of this need should increase one's comfort and well-being. 3) The level of stress at work and job satisfaction is related to specific health outcomes, in terms of burnout and the mental health status. It was assumed that the individuals who experience lower stress, due to their high sense of personal control, should manifest a lower level of burnout and better mental health [15]. Therefore, the sense of personal control should correlate negatively with two burnout components: Emotional Exhaustion and Depersonalization, and positively with Personal Accomplishment. It should also exhibit negative correlation with different measures of well-being.

To verify these assumptions and assess the validity of the questionnaire, each subject was asked to make a self-assessment of: 1) the sense of personal control, using SPCW Questionnaire; 2) the job satisfaction, using the questionnaire on 22 job characteristics; 3) the level of burnout, using Maslach Burnout Inventory (MBI) [16]; and 3) the well-being, using the 28-item General Health Questionnaire (GHQ-28) by D. Goldberg [17,18].

The results of the analysis are shown in Table 5. All correlation coefficients, according to our expectations, confirm the positive assessment of SPCW Questionnaire validity. The construct validity was also determined by means of factor analyses. Following the results of the first and second examinations, conducted in the same group of subjects ($n = 160$), two exploratory factor analyses were made. The data are presented in Tables 6 and 7. Both analyses revealed a 6-factor solution, which did not comply with the dimensions of the sense of control proposed in the definition. In both analyses, the six factors explain about 60% of variance. The first three factors were found in both analyses although there were slight differences between them. Items 8, 9, 10, and 12, which concern social aspects of control are loaded by Factor I. Factor II refers to items 13, 14, 16 and 17 pertaining to control over work tasks and work scheduling. Factor III from the first examination (Table 6) corresponds, to some extent, with Factor V from the second examination and refers to items 5 and 6, which deal with control over work pacing.

Table 5. Correlation between the sense of personal control and assessment of job satisfaction, work stress, burnout and mental health

Variables	SPCW Questionnaire Scales			
	Relationship	Freedom	Competence	Total score
Job satisfaction	0.36***	0.41***	0.33***	0.44***
Work stress	-0.26***	-0.31***		-0.33***
Burnout	Emotional exhaustion	-0.17*	-0.26***	-0.28***
	Accomplishment	0.19**	0.23**	0.25***
	Depersonalisation	-0.26***	-0.18*	-0.21**
GHQ-28	Somatic symptoms	-0.03	-0.08	-0.19**
	Anxiety and insomnia	-0.03	-0.15*	-0.31***
	Social dysfunction	-0.03	-0.04	-0.05
	Severe depression	-0.05	-0.07	-0.07
	Total	-0.04	-0.13	-0.25***

* p < 0.05
 ** p < 0.01
 *** p < 0.001

The results of the factor analyses indicate that the theoretical structure of questionnaire items (Table 1) is inconsistent with the empirical structure.

Table 6. Factor analysis of SPCW Questionnaire items (n = 160), first examination

Factor	Item	Factor loading	Eigenvalue	% of variance
I	8	0.61	4.764	23.8
	9	0.71		
	10	0.84		
	12	0.76		
II	13	0.52	2.686	13.4
	14	0.68		
	16	0.50		
	17	0.70		
III	6	0.54	1.354	6.8
	5	0.65		
IV	2	0.44	1.900	5.9
	4	0.51		
	7	0.57		
	11	0.69		
V	1	0.71	1.130	5.6
	3	0.71		
	18	0.43		
VI	15	0.72	1.063	5.3

CONCLUSIONS

An individual develops the sense of personal control over a given class (category) of situation when he/she:

Table 7. Factor analysis of SPCW Questionnaire items (n = 160), second examination

Factor	Item	Factor loading	Eigenvalue	% of variance
I	7	0.59	4.995	25.0
	8	0.79		
	9	0.62		
	10	0.67		
	12	0.73		
II	11	0.67	2.294	11.5
	14	0.56		
	16	0.62		
	17	0.53		
III	4	0.71	1.545	7.7
	18	0.65		
	19	0.46		
IV	3	0.55	1.277	6.4
	13	0.52		
	15	0.75		
V	5	0.45	1.760	5.9
	6	0.67		
	20	0.72		
VI	1	0.59	1.057	5.3
	2	0.74		

- is able to recognize a causal relationship between his/her own activity/behavior in these situations;
- is convinced that he/she can influence the course of events and reach the goals;
- feels that the achievement of these goals depends mostly on him/her.

Since the literature review did not help us to find an appropriate measuring tool that would be compliant with our theoretical assumptions, we decided to develop a questionnaire that would enable us to assess both the general sense of personal control in the occupational context and its particular dimensions according to the definition. The analysis of the psychometric parameters of the questionnaire (discrimination power of items, reliability and validity) provided adequate evidence to support its usefulness as a measuring instrument. The only issue still not quite clear is a relatively low reliability coefficient of the questionnaire scales. At this stage of the study on SPCW Questionnaire, we presume that the consideration of the total score should be recommended. More definite assessment is expected to be accomplished in the course of further studies carried out in less homogenous populations (than the one examined so far).

We are not going to make any definite statement on the measurement of the three dimensions of the sense of personal control discussed above. We expect that the division of the control perception into subcategories may prove useful, e.g. in the preventive program aimed at reducing work-related stress, when psychologists may wish to use the data on the structure of control perception to define the activities for reducing work stress. However, we suggest that the psychologists who would like to employ our method should be particularly cautious when interpreting the results referring to the Competence dimension. The reliability coefficient for the scale used to measure this subcategory appeared to be relatively low. Nevertheless, the reliability determined for the total score is adequate for the questionnaire to be safely applied.

REFERENCES

1. Hackman R, Oldham GR. *Development of the job diagnostic survey*. J Appl Psychol. 1975; 60 (2): 159–70.
2. Makin PJ, Cooper CL. *Organizations and Psychological Contract*. Leicester: The British Psychological Society; 1996.
3. Parkes KR. *Personal control in an occupational context*. In: Steptoe A, Appels A, editors. *Stress Personal Control and Health*. Chichester: John Wiley and Sons Ltd.; 1989.
4. Karasek R, Theorell T. *Healthy Work. Stress, Productivity and the Reconstruction of Working Life*. Basic Books; 1990.
5. Rotter JB. *Generalized expectancies for internal versus external control of reinforcement*. Psychol Monographs 1966; 80: 1–28.
6. Antonovsky A. *Unraveling the Mystery of Health. How People Manage Stress and Stay Well*. Warsaw: Institute of Psychiatry and Neurology Foundation; 1995 [in Polish].
7. Szmajke A. *The tendency to secure the feeling of control of events as a modifier of attributive opinions and perception of people*. Przegł Psychol. 1989; XXXII (1): 155–83 [in Polish].
8. Karasek RA Jr. *Job demands, job decision latitude and mental strain: Implications for job redesign*. Adm Sci Q 1979; 24: 285–307.
9. Karasek RA Jr. *Control in the workplace and its health-related aspects*. In: Sauter SL, Hurrell JJ Jr, editors. *Job Control and Worker Health*. New York: Wiley; 1989.
10. Spector PE. *Development of the work locus of control scale*. J Occup Psychol. 1988; 61: 335–40.
11. Bryant FB. *A four factor model of perceived control: avoiding, coping, obtaining, and savoring*. J Personal 1989; 57 (4): 773–98.
12. Ganster DC. *Improving measures of worker control in occupational stress research*. In: Steptoe A, Appels A, editors. *Stress Personal Control and Health*. Chichester: John Wiley and Sons Ltd.; 1989.
13. Brzeziński J. *Methodology of Psychological Testing*. Warsaw: PWN; 1996 [in Polish].
14. Cook M. *Personnel Selection and Productivity*. Chichester: John Wiley and Sons Ltd.; 1993.
15. Sęk H, editor. *Occupational Burnout. Psychological Mechanisms and Conditioning*. Poznań: K. Domke Publishing House; 1996 [in Polish].
16. Maslach Ch, Jackson SE. *The measurement of experienced burnout*. J Occup Behav 1981; 2: 99–113.
17. Goldberg D, Williams P. *Answer's Guide to the General Health Questionnaire*. Windsor; The NFER-Nelson Publishing Company Ltd.; 1988.
18. Makowska Z, Merez D. *Evaluation of Mental Health with the Help of General Health Questionnaires by David Goldberg. GHQ-12 and GHQ-28. User's Guide*. Łódź: Nofer Institute of Occupational Medicine; 2001 [in Polish].

Received for publication: October 25, 2001

Approved for publication: February 1, 2002

Annex

1. THE SENSE OF PERSONAL CONTROL AT WORK (SPCW) QUESTIONNAIRE

The questions you will find below concern your assessment of the capacity for decision making and freedom of

choice that you have in your work. Please read the questions carefully and circle on the respective scale the answer that best reflects your own opinion. Should you change your mind, please cross out the first choice and circle the right answer.

1.	Can you see any relationship between the effort you make while performing work tasks and the outcomes of your work?	1 very strong	2	3	4	5 none
2.	How much can the decisions you make at work influence the quality of your job?	1 not at all	2	3	4	5 very much
3.	How much, do you think, your personal skills, competence and experience are sufficient for the best performance of your work tasks?	1 very much	2	3	4	5 very little
4.	Does the ending time of your work tasks depend on your work pacing?	1 not at all	2	3	4	5 very much
5.	How much can you decide about your work pacing?	1 very much	2	3	4	5 not at all
6.	How much does your work pacing comply with your preferences and temperament?	1 not at all	3	4	4	5 very much
7.	How much can your views and opinions on the job influence the attitude and behaviour of your colleagues?	1 very much	2	3	4	5 not at all
8.	How much can your views and opinions on the job influence the attitude and behaviour of your superiors?	1 very much	2	3	4	5 not at all
9.	In your work, can you choose from many methods to exert influence on your colleagues?	1 not at all	2	3	4	5 very much so
10.	In your work, can you choose from many methods to exert influence on your superiors?	1 not at all	2	3	4	5 very much so
11.	How much can you use your personal skills, competence and experience to exert influence on your colleagues?	1 very much	2	3	4	5 not at all
12.	How much can you use your personal skills, competence and experience to exert influence on your superiors?	1 very much	2	3	4	5 not at all
13.	How much can you implement your own concepts and ideas regarding your work performance?	1 very much	2	3	4	5 not at all
14.	How much can you decide about the means of work performance?	1 not at all	2	3	4	5 very much
15.	When undertaking a work task, do you feel your personal skills, competence and experience are adequate to choose the best way of performing that task?	1 very much so	2	3	4	5 not at all
16.	How much the tasks you have to perform comply with the schedule you made beforehand?	1 not at all	2	3	4	5 very much
17.	Do you have any freedom to schedule your work tasks?	1 very much so	2	3	4	5 not at all
18.	Can you schedule your work tasks using your own competence and experience?	1 not at all	2	3	4	5 very much so