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## APPLIED PSYCHOLOGY | RESEARCH ARTICLE

# Work satisfaction, psychological resiliency and sense of coherence as correlates of work engagement

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**Abstract:** The objective of the article is to describe the links between work engagement—the response variable, work satisfaction—the explanatory variable, and sense of coherence, along with resiliency as resources—moderating variables. The theoretical foundations for our hypotheses are Hackman and Oldham’s Job Characteristics Model, Block and Kremen’s conception of resiliency, Antonovsky’s salutogenesis, the JD-R of relation between work demands and resources and also the model of work engagement in the research of Schaufeli, Salanova, González-romá, and Bakker. **Methods:** 94 independent workers of Polish branches of international corporations were studied. Work satisfaction was measured using the SSP survey, engagement by UWES, resiliency with SPP-25 and sense of coherence with SOC-29. The recorded results consistent with the theory confirm the posited hypotheses indicating mutual links among the tested variables. For work engagement, of the greatest significance is work satisfaction and sense of coherence, which is a better mediator of work satisfaction in respect of engagement than resiliency. Discussion of the results indicates the accuracy of the study’s theoretical foundations, as well as the need to perform research on a larger sample of new predictors of work engagement.



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Romuald Derbis is a professor at the University of Opole, a social and labor psychologist, the head of the Department of General and Labor Psychology. Taking the perspective of positive psychology, he deals with: the relationship between affective and cognitive processes, human experiences at work and outside the work environment, theory and measurement of a sense of quality of life and a sense of responsibility. In these research areas, he published about a hundred articles in Polish and English languages.

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### PUBLIC INTEREST STATEMENT

Relations between work engagement, work satisfaction and personality traits are interesting from two general points of view. First, finding of correlates of work engagement is important for researchers developing theories. The theoretical development will have the capacity for enrichment of academic teaching. Secondly, conclusions presented in the article are applicable and have practical implications. We hope, that results revealed in the study can be applied in practice to build a new work environment in which employees perceive the sense of the challenges undertaken, understand them and perceive their resources as adequate for achieving the task. Furthermore, recruitment and selection processes can be modified by including relevant personality criteria, emotion regulation training can be conducted or in accordance with the tenets of the model presented in this article. An attempt can be made in the organization at optimizing the relations of resources with demands.

**Subjects: Psychological Science; Social Psychology of Organizations; Work & Organizational Psychology**

**Keywords: work satisfaction; work engagement; resiliency; sense of coherence; mediation**

## 1. Introduction

The objective of this article is to describe the links between work engagement—the response variable, work satisfaction—the explanatory variable, and the moderating variables: resiliency and sense of coherence. We wish to find answers to the following questions: (1) Is there a link between work satisfaction and work engagement? (2) Is work satisfaction associated with resiliency and sense of coherence? (3) Are resiliency and sense of coherence associated with work engagement? (4) Do resiliency and sense of coherence mediate the association between work satisfaction and work engagement? A synthetic presentation of the theoretical foundations of the dependent variables is necessary, as well as using them as a source for arguments in support of our own hypotheses on the links between them.

### 1.1. Work satisfaction

Work satisfaction can generally be defined as a judgement of the difference between what individuals expect and what they in fact experience at work (Drenth, Thierry, & de Wolff, 1998). Previously, Lock (1976) defined work satisfaction as the individual's perception of enjoyment and/or positive emotions in the process of assessing work. Correlates of work satisfaction can be altered too in order to maintain employee satisfaction and reduce burnout, absenteeism and turnover (Martin & Schinke, 1998). We are interested not so much in the correlates or predictors of work satisfaction as we are in its consequences. We perceive satisfaction as a predictor of work engagement work engagement, similarly to Hackman and Oldham (1975), who sought out factors boosting work motivation and productivity. Their JCM model (Job Characteristics Model) was a model of work design. According to these researchers, the experience of positive emotions towards work is associated *inter alia* with the perception of sensibility of work, which in turn links the concept with Antonovsky's important dimension of sense of coherence (Antonovsky, 1979, 1995). In our paper, sense of coherence has the status of a mediator of work satisfaction on work engagement.

The ways in which work satisfaction is defined are generally linked with the manner in which work gratification is defined. Three primary ways of doing so can be identified in the literature: (a) satisfaction is one of the constituent elements of work gratification, (b) gratification is a factor boosting satisfaction, (c) gratification is the same thing as satisfaction. We understand work satisfaction as a constituent element of work gratification, which is created through cognitive and affective mechanisms. Gratification is superordinate in relation to work satisfaction. This is a type of attitude which expresses the general internal condition of an employee, affects judgements and assessments concerning the work environment. Work satisfaction is a cognitive aspect of gratification (Zalewska, 2002). The affective aspect is mood or well-being in the workplace. Life satisfaction and gratification are strongly (.80) associated with each other (Inglehart, Foa, Peterson, & Welzel, 2008). These two constructs share a common family of meanings because, from the psychological perspective, it is difficult to eliminate affects from judgements (Derbis, 2007; Halevy, Cohen, Chou, Katz, & Panter, 2014).

### 1.2. Work engagement

Work engagement is, generally speaking, the feeling of strong and real bonds with one's work, and the worker's conviction of being capable of effectively coping with the demands of work. It is something different from work motivation and work gratification. Kahn (1990) writes that work engagement is "being fully there" that is, emotional, cognitive and physical fulfilment at work. Psychologists frequently employ the construct of "engagement" in relation to work (work engagement) or employment (Chirkowska-Smolak, 2012; Demerouti, Bakker, Nachreiner, & Schaufeli, 2001; Derbis & Baka, 2011; Maslach, Schaufeli, & Leiter, 2001). This is a multidimensional construct of a dualistic character. On the one hand, engagement can lead to professional burnout, thereby disrupting the relations

between work and home life. On the other hand, an engaged life is an element of happiness accompanying a meaningful life and a pleasant life (Seligman & Csikszentmihalyi, 2000). Engagement leads to happiness and work satisfaction, while work satisfaction can reinforce work engagement. Work satisfaction is a predictor of judgements of the chance that a goal will be attained. It has a strong impact on the cognitive assessment of a chosen objective as one which can potentially be achieved (Łaguna, 2012). It protects us from the emergence of negative effects that result from the experience of stress, such as burnout. The link between engagement and personal and social resources is indicated by Hobfoll (1989) and Demerouti et al. (2001), who applied Hobfoll's theory in the development of the JD-R model (Job Demands—Resources), under which work engagement, when one possesses the relevant personal resources (e.g. sense of coherence, resilience) and social resources (e.g. social support), provide protection against professional burnout. The role of personal resources as a mediator between work resources and work engagement has been demonstrated in several studies (Tziner, Rabenu, Radomski, & Belkin, 2015; Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2007). Employees more eagerly do what gives them satisfaction than what they feel they have to, or when they think a task is pointless. Work must be perceived by employees as important from the perspective of their values. By the same token we obtain yet another argument in support of the hypothesis that work satisfaction is positively correlated with work engagement. We argue in support of the link between work satisfaction and work engagement by pointing to the significance of work sensibility (itself a component of coherence) in the development of positive feelings at and towards work. Maslach et al. (2001) claim that engagement is comprised of three elements: high energy level, dedication to work and sense of efficacy. Its opposite is professional burnout. Interesting views on work engagement have been presented by Schaufeli, Salanova, González-romá and Bakker (2002) and Schaufeli and Salanova (2007). In their view, work engagement is not a temporary state, but rather an intensifying affective and cognitive relation of the employee to duties, people and objects associated with work. Work engagement is not the opposite of burnout, but is a personal dimension, complementary in respect of burnout. It is characterized by three symptoms: vigour—a high level of energy and endurance during work; dedication—a strong identification with work, pride in work done; and absorption—concentration on work, immersion in it. This understanding of work engagement, associated with the JD-R model, is the one we have adopted in our research, and it will serve as the foundation for operationalization of that variable.

### **1.3. Resiliency and sense of coherence as personal resources**

Personal resources, which include resiliency and sense of coherence, are generally activated in various types of difficult situations in order to serve as coping mechanisms. However, situations which generate positive affects can also activate and reinforce resources. Their development makes it easier to attain results, which leads to positive affect and further growth in resources (Fredrickson, 2001). If they are rich enough, they can assist in behaviour regulation through e.g. increased involvement in activities, as well as so-called Organizational Citizenship Behaviour (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001; Podsakoff, MacKenzie, Paine, & Bachrach, 2000). Resiliency is a multi-dimensional construct, a personal resource dependent on age, sex, origin, culture and life circumstances (Connor & Davidson, 2003). It is one of the characteristics of an individual which can be refined and reinforced in the course of development (Masten & Reed, 2002). It implies hardiness and positive adaptation in adverse life conditions. It is a type of resource based on control of Ego (Block & Kremen, 1996). Low control of Ego is low impulse control, high amplitude of affects and expression of emotions independently of the situation. High control is excessive restraint or shutting down of the expression of affects, problems with decision-making and refusing to allow oneself pleasure, but also good organization and determination in action. Individuals with high resiliency levels are characterized by a relatively high level of optimism and internal calm. They are also distinguished by high life energy levels, curiosity, flexibility and self-confidence. In this work we apply the understanding of resiliency advanced by Block and Kremen (1996), Ogińska-Bulik and Juczyński (2008a), as well as Kaczmarek (2009), understand it as adaptive flexibility, capacity to adapt impulse control levels to the situation, a relatively hardy disposition and a personality trait. It is helpful both in the process of dealing with traumatic events and in the use of positive events. According to some psychologists, the notion of resiliency cannot be identified with the term resilience, i.e. resistance, which is a process

leading to effective adaptation in the face of adverse conditions, whereas resiliency is a personality trait (Kaczmarek, 2009).

A large number of studies indicate that resiliency is present in behavioural regulation as a mediator, such as in the relation of stress—quality of life (Liu, Wang, & Lü, 2013; Ogińska-Bulik, 2014). Fredrickson, Larkin, Tugade, and Waugh (2003) demonstrated that positive emotions are employed by people with a high level of resiliency as an active mediator leading to post-traumatic growth. Prisoners with a high level of resiliency demonstrated low levels of apprehension, which means that resiliency may be a mediator in resocialization of prisoners with psychopathic personality (Sandvik, Hansen, Hystad, Johnsen, & Bartone, 2015). In turn, Vulpe and Dafinoiu (2012) demonstrated that resiliency mediates the relation between experience of positive emotions and strategies for coping with stress. Their studies demonstrate that positive emotions are responsible for building up personal resiliency. By the same token, an argument emerges for the supposition that there is a positive relation between work satisfaction and resilience, and that resiliency both bolsters work engagement and mediates the relationship of work satisfaction—work engagement. Our hypotheses are supported by arguments that personal resiliency is a sort of meta-resource impacting perception of one's situation, and a means of employing other resources. People with high levels of resiliency perceive the world in terms of challenges, and also through the lens of their own competencies, which they view as sufficient for performing the tasks they face. Resiliency may also have a positive impact on work engagement because it supports the occurrence of positive affect and emotional stability, which themselves reduce susceptibility to stress and burnout. Studies have shown that resiliency is negatively correlated with emotional exhaustion, as well as depressive and avoidance behaviours, and also professional burnout (Mróz, 2014). It should be observed that in the majority of dependencies described above, resiliency does not directly protect against the experience of situations as stressful, burnout or declining work engagement as it contributes to constructing effective coping strategies, as well as retention of psychological comfort or a quick restoration of it.

Sense of coherence (SOC) is a fundamental construct and the core of the salutogenetic model of health as developed by Antonovsky (1979, 1995). This model contains numerous loopbacks, but the theoretical core is sense of coherence, which is responsible for coping with stress, and therefore for the health of the individual. The generalised resistance resources (GRR) which emerge throughout life are the essence of sense of coherence. This is a global, coherent and durable, but also dynamic life orientation, which develops under the influence of experiences. It can be described by way of its three components. Two of them are based on a rational assessment of stimuli. They are: comprehensibility, which concerns judgement of comprehensibility, the predictability and structure of stimuli and manageability, which concerns assessment of availability of resources necessary for handling the demands presented by stimuli. The third component is based on affects. It is meaningfulness, which relates to assessment of the meaning of life and the sense of effort, as well as the engagement demanded by particular challenges. As the emotional equivalent of comprehensibility, it organizes the motivational functions of sense of coherence.

Sense of coherence would seem to associate with work satisfaction in a similar manner to resilience. In studies by Finogenow (2013), the most important predictor of life satisfaction for older people was the sense of resourcefulness. Grabowski and Rachwaniec-Szczecińska (2015) report that the components of sense of coherence explain around 28% of work gratification, and the greatest share in this belongs to sense of meaningfulness. They do not, however, reject the reverse dependency, that is the dependence of coherence on work gratification, and they assume that these variables are directly linked, without a mediator. Work gratification in their studies explains approximately 25% of variance in sense of coherence. If work satisfaction impacts the cognitive assessment of a goal as being achievable (Łaguna, 2012), this may also be associated with resourcefulness and meaningfulness, which are components of sense of coherence that determine involvement and engagement in an activity. The argument arises that coherence may be a mediator of the relation work satisfaction—work engagement. The level of sense of coherence and variables we have studied describing the work situation (work satisfaction i work engagement) remain linked, but they are not

described and elaborated sufficiently. Thus, the question remains as to the relations which exist between them.

Associations between the components of resiliency and coherence may occur because the dimensions of the two constructs mutually condition one another. For example, comprehensibility and meaningfulness of the world as components of coherence would seem to be associated with the components of psychological resilience: perseverance in action, openness to experience, personal competences and life optimism. Understanding of the world is bolstered by traits described as components of resilience, which does not exclude the significance of resiliency for sense of coherence. Both resiliency and sense of coherence can appear in the same behaviour symptom that is work engagement.

Life happiness requires a pleasant, engaged and meaningful life (Seligman, 2015; Seligman & Csikszentmihalyi, 2000), while an important component of sense of coherence is the perception of meaningfulness in a given activity, as well as the conviction that it is worth taking up some challenges and getting involved in goals. The stronger one's sense of coherence, the better one copes with a given situation. It can thus be supposed that sense of coherence is positively associated with work engagement and mediates in the association of assessment of work situation as the foundation of work satisfaction—work engagement. In other words, work satisfaction is positively correlated with motivation to engage in new activities and work engagement, while coherence and resiliency explain this correlation.

#### **1.4. Research hypotheses**

In the tested model, resiliency and sense of coherence are treated as substantively separate but functionally correlated resources, which mediate the relation of work satisfaction—work engagement. We assume that particular components of the tested mediating variables have various mediating strength for each tested dimension of engagement. That said, we are also taking into account the postulate by Antonovsky (1979, 1995) that all of the components of coherence are associated with one another, and its general significance for perception of the situation and regulation of behaviour depends on the level of each of them. For transparency of the structure of the hypotheses, we do not include in them components of the measured variables, but they are accounted for in statistical testing.

In testing the significance of resiliency and coherence as mediators in the relation between work satisfaction and work engagement, we take them into account in one model, but in two different ways. One, when the tested effect concerns mediation of the tested association through coherence explaining resilience. The second in the opposite manner concerns mediation through resiliency explaining coherence. Combining the two mediators in one model allows for a determination of whether they differ in their significance for the tested relation.

Taking into account the arguments formulated as well as the suppositions formed above and based on Hackman and Oldham's (1975) JCM model, which concerns designing work and satisfaction from it, Block and Kremen's (1996) concept of resilience, Antonovsky's (1979, 1995) salutogenic theory, the JD-R model (Demerouti et al., 2001) and the associated work engagement model by Schaufeli et al. (2002), along with the results of the cited studies, we formulate the following hypotheses:

*H1.* Work satisfaction and work engagement are positively correlated.

*H2.* Work satisfaction is positively correlated with resiliency and sense of coherence.

*H3.* Resiliency and sense of coherence are positively correlated with work engagement.

*H4.* Resiliency and sense of coherence are positively correlated with each other, and they mediate the relation between work satisfaction and work engagement.

## 2. Methods

### 2.1. Participants and procedure

The anonymous studies were performed in the spring of 2016, among independent consultants, specialists and managers of Polish branches of international corporations operating in south-west Poland. The participants ( $n = 94$ ; female = 62, male = 32; age range 21–56 years,  $M = 39.6$ ,  $SD = 3.8$ ) had a certain amount of autonomy in the performance of relatively demanding tasks. Selected for the studies were employees in jobs whose characteristics (autonomy, highly demanding, irregular working time) facilitate accurate predictions of behaviours on the basis of personality (Juchnowicz, 2012) and impact engagement (Kulikowski & Madej, 2014). Tools in paper form were delivered to randomly selected employees by the branch director. Participants placed the completed questionnaires in closed boxes, after which they were retrieved by an assistant of this paper's authors. The study was approved by the Ethical Review Committee of a Polish Psychological Association. All participants provided informed consent before participating.

### 2.2. Measures

#### 2.2.1. Work satisfaction

Work satisfaction was tested using the Work Description Inventory (Neuberger & Allerbeck, 1978; Zalewska, 2001), which measures the cognitive aspect of work gratification. For the purposes of this study and owing to economic considerations, only the summary questions for each of the seven dimensions of gratification were used (co-workers, superior, nature of work, work conditions, organization and management, development, remuneration + 2 general: work time, certainty of work). In total, nine questions were asked, with responses given on a Likert scale of 1–7. A highly satisfactory reliability coefficient was achieved of Cronbach's  $\alpha = .92$ .

#### 2.2.2. Work engagement

Work engagement was examined using the Utrecht Work Engagement Scale (Schaufeli & Bakker, 2003; Szabowska-Walaszczyk, Zawadzka, & Wojtaś, 2011). The UWES is based on the concept of work engagement proposed by Schaufeli et al. (2002) and Schaufeli and Salanova (2007). It is composed of three scales, each of which contains three statements. In our tests the scales achieved satisfactory reliability coefficients of Cronbach's  $\alpha$  for vigour (.79), absorption (.78), work commitment (.87), with a total score of .85. Responses are given by entering a numerical value next to each item from 0 (never) to 6 (always/every day). Engagement level is indicated by the total of points from all responses.

#### 2.2.3. Resiliency

Resiliency was assessed using the Resiliency Scale (Ogińska-Bulik & Juczyński, 2008b). The Scale recorded a reliability coefficient of Cronbach's  $\alpha = .81$ . Reliability for the subscales was as follows: Determination and perseverance in action (.68), Openness to new experiences and sense of humour (.77), Coping skills and tolerance of negative emotions (.86), Tolerance of failure and viewing life as a challenge (.90), Optimistic attitude towards life and capacity for self-mobilization in difficult situations (.87). These are satisfactory coefficients on par with those recorded by the authors of the instrument. Participants assessed statements on a five-point Likert scale, from 0 ("strongly disagree") to 4 ("strongly agree"). A higher score indicates a higher level of resilience.

#### 2.2.4. Sense of coherence

Sense of coherence was assessed using the Orientation To Life Questionnaire SOC-29 (Antonovsky, 1993; Koniarek, Dudek, & Makowska, 1993). In our study, the scale as a whole recorded a reliability coefficient of Cronbach's  $\alpha = .86$ . The coefficients for particular subscales were: sense of comprehensibility (.82), sense of resourcefulness (.91), sense of meaningfulness (.86). This is a satisfactory level of reliability. Participants rated statements on a seven-point Likert scale. In the SOC-29 instrument, depending on the content of a given statement only the extreme values of the scale are described.

The level of sense of coherence is the value of the total of responses to all questions. Some of them are inverted in form.

### 3. Results

#### 3.1. Descriptive statistics and regression analysis

Three of the four tested variables displayed slightly left-skewed distributions: resiliency ( $M = 72.09$ ;  $SD = 13.42$ ;  $As = -.65$ ;  $K = .58$ ), work satisfaction ( $M = 45.09$ ;  $SD = 11.34$ ;  $Sk = -.48$ ;  $K = -.95$ ) and work engagement ( $M = 38.18$ ;  $SD = 10.15$ ;  $Sk = -.88$ ;  $K = .57$ ); one of them, sense of coherence, was normal ( $M = 138.2$ ;  $SD = 23.36$ ;  $Sk = .07$ ;  $K = -.77$ ). The normality of the distributions in the measured variables was determined using the Kolmogorov–Smirnov test and the Shapiro–Wilk test.

The collected data was subjected to statistical analysis, which demonstrated that the variables we explored are, in fact, in the correlative relations predicted in  $H1$ ,  $H2$  and  $H3$  (Table 1).

The value of Pearson’s  $r$  for the primary variables of work satisfaction and work engagement was  $.56$ ,  $p < .001$ . The same level of significance is achieved by the variables of satisfaction and coherence ( $.63$ ), but the association between work satisfaction and resiliency is weaker ( $.32$ ,  $p < .01$ ). However, there is a strong link ( $.69$ ,  $p < .001$ ) between the two mediators of resiliency and coherence. At the same time, coherence is more strongly correlated with engagement ( $.69$ ,  $p < .001$ ) than resiliency ( $.46$ ,  $p < .001$ ). In order to test whether they are also distinguished by the strength of mediation, a model with two simultaneous mediators was tested for the correlation work satisfaction—work engagement. Prior to that, however, the standard Person’s  $r$  correlations of work satisfaction, resilience and coherence with components of engagement (vigour, work dedication, absorption) were calculated (Table 2).

All correlations are statistically significant. By the same token, this reinforces the argument for the predictions contained in  $H1$ – $H3$ . Each component of engagement is correlated with all of the explanatory variables we tested (work satisfaction, resilience, sense of coherence). However, our attention is grabbed by the stronger correlations of coherence with all of the components of engagement over those of resiliency with said components. Thus, these results as well suggest that sense of coherence is of greater significance to the association of work satisfaction and work engagement than resilience. This supposition was also examined via regression analysis, and then

**Table 1. The Pearson correlation factors between analysed variables**

	Work engagement	Job satisfaction	Resiliency
Work engagement			
Job satisfaction	.56***		
Resiliency	.46***	.32**	
Sense of coherence	.69***	.63***	.69***

\*\* $p < .01$ .

\*\*\* $p < .001$ .

**Table 2. The Person correlation factors between job satisfaction, resiliency, sense of coherence and work engagement factors**

	Work engagement	Vigour	Dedication	Absorption
Job satisfaction	.56***	.51***	.59***	.36***
Resiliency	.46**	.52**	.42**	.26**
Sense of coherence	.69***	.66***	.63***	.50***

\*\* $p < .01$ .

\*\*\* $p < .001$ .

through mediation analysis. The results of the latter are significant primarily for verification of *H4*, but also for *H1–H3*.

The data in Table 3 show that all three variables explain roughly 50.0% ( $R^2 = .503, p < .001$ ) of the variance of work engagement. However, they also demonstrate the absence of a link between engagement and resilience, for which the standard value is  $\beta = .03$  if resiliency occurs together with sense of coherence. In turn, for the correlation between sense of coherence and engagement, we obtain a standardized  $\beta$  value of  $.53$ . These data provide support to *H1*, but weakens *H3*, as resiliency according to the results of this analysis is not associated with work engagement. Normal correlation analysis and regression analysis demonstrate that of fundamental explanatory significance here is work satisfaction ( $\beta = .56$ ) and sense of coherence ( $\beta = .53$ ). The statistically significant decline in the value of  $R^2$  in step 2 compared to step 1 suggests that the relation work satisfaction—work engagement may be mediated by the variables from step 2, particularly by sense of coherence.

### 3.2. Mediation

The empirical observations and theoretical foundations presented above indicate that resiliency and sense of coherence are linked with each other, and may be mediators of the relation work satisfaction—work engagement. In other words, an indirect impact of the two variables was assumed, that is two mechanisms for mediation of the influence exerted by work satisfaction on work engagement. This model, which we shall call Model 1, was examined in two ways. With the use of Model 1.1., where the structure of the mediators is coherence—resiliency (Figure 1), and Model 1.2, where their arrangement is reversed (Figure 2). The data from Figures 1 and 2 allow us to state that sense of coherence in the tested relation is a better mediator than resiliency. In Model 1, the assumptions of mediation for resiliency are not fulfilled. In the coupling of the mediators coherence—resiliency (Model 1.1) we obtain a standardized  $\beta a_2$  value of  $-.18$ , ni, whereas  $\beta b_2 = .03$ , ni. Also in the configuration resiliency—coherence (Model 1.2) we have a standardized  $\beta b_1$  value of  $.07$ , ni. By the same

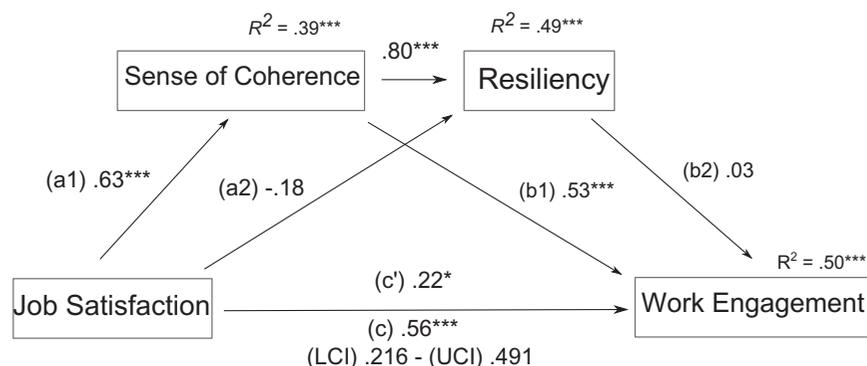
**Table 3. The results of regression analysis explanatory work engagement by job satisfaction, resiliency and sense of coherence**

Order entry	Factors			$\Delta R^2$	F (df)
	B	SE	$\beta$		
Step 1:					
Job satisfaction	.50***	.08	.563	.32***	42.66 (1.92)
Step 2:					
Sense of coherence	.23***	.09	.53	.19***	30.32 (3.93)
Resiliency	.02	.08	.03		
$R^2$	.503***				

\*\*\* $p < .001$ .

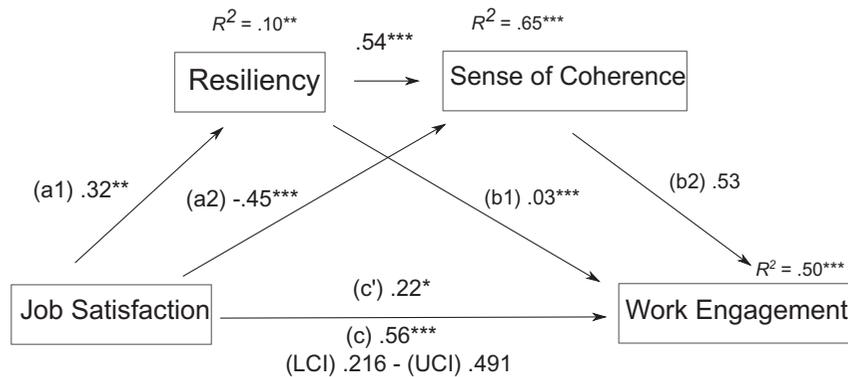
**Figure 1. The effect of mediating the relationship between job satisfaction and work engagement through coherence explaining resilience.**

Notes: The indirect effect:  $a_1 \times b_1 = .33^{***}$ , (LCI) .230 - (UCI) .517,  $a_2 \times b_2 = .01$ ; (LCI) -.050 - (UCI) .030,  $a_1 \times b_2 = .02$ ; (LCI) -.080 - (UCI) .110.



**Figure 2. The effect of mediating the relationship between job satisfaction and work engagement through resilience explaining coherence.**

Notes: The indirect effect:  
 $a1 \times b1 = .01$ ; (LCI)  $-.50$  - (UCI)  $.100$ ,  $a2 \times b2 = .24^{***}$ , (LCI)  $.140$  - (UCI)  $.035$ ,  $a1 \times b2 = .09^{**}$ ; (LCI)  $-.031$  - (UCI)  $.192$ .



token, the mediation role of resiliency in Model 1 is called into question. The entire model explains 50% of the variation of work engagement. In an arrangement of mediators where coherence explains resiliency (Model 1.1), the per cent of variation explained for coherence is 39%, while for resiliency 49%. In the reverse model (Model 1.2), where resiliency explains coherence, these values are 65 and 10%, respectively.

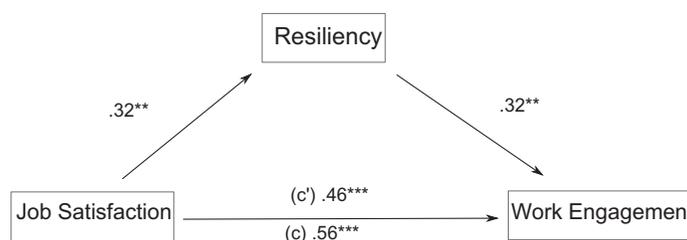
Simultaneously in both models M 1.1 and M. 1.2 the indirect effects for resilience are not statistically significant. In analysis of mediation, the indirect effect ( $\beta a \times \beta b$ ) = total effect ( $\beta c$ )—direct effect ( $\beta c'$ ). In Figure 1, the insignificant indirect effects concern the confidence intervals recorded using the bootstrap method, which contain the value “0” (Preacher & Hayes, 2008).

In this situation, we repeated the analyses of mediations, testing each of the models separately. The mediator in Model 2 is resilience, while in Model 3 it is sense of coherence. First, the three steps necessary for examining the assumptions of mediation were performed. Testing was done on the total effect, that is, on the statistical significance of the correlation between predictor X and the response variable. This effect is equal to the standardized regression coefficient of predictor X on the dependent variable without accounting for the mediating variable of M. This is the total effect (step 1—path c). Next, the same assumption was examined for the dependency between X and mediator M (step 2—path a). At the end, we tested that between M and Y (step 3—path b). The analyses demonstrated that all three assumptions were fulfilled for our data in Model 2 (M—resilience) and Model 3 (M—coherence). In Model 2, a coefficient value was recorded for step 1 of  $\beta c = .56$ ,  $p < .001$ , while for step 2  $\beta a = .32$ ,  $p < .05$  and for step 3  $\beta b = .32$ ,  $p < .001$ . For Model 3, the values of the coefficients of the paths were  $\beta c = .56$ ,  $p < .001$  for step 1;  $\beta a = .63$ ,  $p < .001$  for step 2 and  $\beta b = .55$ ,  $p < .001$  for step 3. This data along with the value of  $\beta c'$  (direct effect) is illustrated in Figures 3 and 4.

Work satisfaction is more strongly associated with sense of coherence ( $\beta a = .63$ ,  $p < .001$ ) than with resiliency ( $\beta a = .32$ ,  $p < .01$ ). Coherence, however, is more strongly associated with work engagement ( $\beta b = .55$ ,  $p < .001$ ) than resiliency ( $\beta b = .32$ ,  $p < .001$ ). First and foremost, control of the indirect effect in Model 3 gives a weaker direct effect of work satisfaction on engagement ( $\beta c' = .22$ ,  $p < .05$ ) than in Model 2 ( $\beta c' = .46$ ,  $p < .001$ ). Reference of direct effects to the whole ( $\beta c = .56$ ,  $p < .001$ ) allow us to declare that in the tested models we can observe partial mediation. The

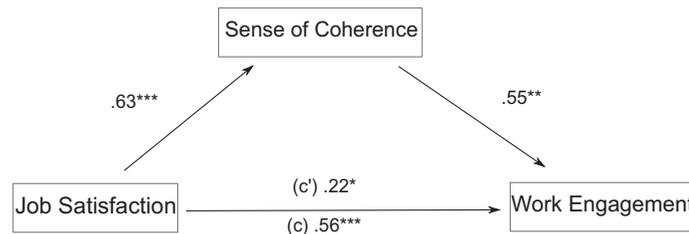
**Figure 3. Model 2: Resilience as a mediator in a relation between job satisfaction and work engagement.**

Notes: The indirect effect:  
 $a \times b = .10$ ; (LCI)  $.023$  - (UCI)  $.241$ .



**Figure 4. Model 3: Coherence as a mediator in a relation between job satisfaction and work engagement.**

Notes: The indirect effect:  
 $a \times b = .35$ ; (LCI) .230 - (UCI) .517.



supposition was confirmed that resiliency is a weaker mediator of the association work satisfaction—work engagement than is sense of coherence. For this reason, as well as due to high and statistically significant standardized weights of  $\beta c$ , which we have not presented here and which were achieved by testing the mediation of resiliency on individual components of engagement, further analyses of mediation were only conducted for coherence. In a separate test of mediators, sense of coherence retains its significance and changes the values of the standardized indicators of the  $\beta$  variables. The mediation strength of resiliency visible in Model 1, where the mediators are tested jointly in separate testing of the mediators (M1 and M2) is weaker than coherence.

The level of sense of coherence for particular scales was on an average level ( $M = 46.17$ ;  $SD = 9.63$ ), sense of resourcefulness ( $M = 49.54$ ;  $SD = 8.20$ ), sense of meaningfulness ( $M = 42.53$ ;  $SD = 7.89$ ). Further analyses consisted in testing the mediating role of all the components of coherence on all of the components of engagement. The results are illustrated in Table 4. Figures 5–8 additionally present full mediations in which the coefficient of the regression  $\beta c'$  is statistically insignificant, while the values of the indirect effects are located within 95% of the confidence intervals not containing “0”, which confirms the full mediation in those models.

According to the criteria of mediation, if the following occurs: (1) after fulfilling the conditions from the above steps 1–3, the standardized regression coefficient of the variable X on variable Y, with control of variable M ( $\beta c'$ ) is smaller than the standardized regression coefficient of variable X on variable Y without control of variable M ( $\beta c$ ); (2) the values of the indirect effects ( $\beta a \times \beta b$ ) are within 95% of the confidence intervals not containing “0”, all components of coherence mediate work satisfaction on all components of engagement.

However, the full mediation ( $\beta c > \beta c'$  ni and the indirect effect of  $\beta a \times \beta b$  statistically significant) of all three dimensions of SOC (comprehensibility, manageability, meaningfulness) in the relation work satisfaction—work engagement are present for only one dimension of engagement: absorption (Figures 4–6).

In addition, meaningfulness fully mediated work satisfaction on one component of engagement—vigour. (Figure 8). By the same token, meaningfulness as a component of sense of coherence is the strongest mediator of the relation being examined. It concerns assessment of the sense of engagement required by particular challenges. It is the affective equivalent of another component of coherence—comprehensibility. In other words, work satisfaction particularly activates the motivational component in sense of coherence. The employees participating in the study were engaged in tasks which they believed were meaningful. It should be observed that in the model of engagement developed by Schaufeli and collaborators (Fredrickson, 2001; Schaufeli et al., 2002), absorption, that is preoccupation with work, means concentration on it, the feeling that time goes quickly during work, and that it is hard to tear oneself away from it. We may adopt the interpretation that in engagement in work, understood as preoccupation with work, work satisfaction may emerge among the employees we examined if they have a feeling of the work’s meaning.

**Table 4** The effects of mediation components of sense of coherence in relation to job satisfaction—components of Work Engagement. All the indirect effects (a × b) are statistically significant (the regression factors are in the 95% intervals LCI—UCI does not contain zero)

Effects	Work engagement											
	Vigour				Dedication				Absorption			
	Comprehensibility	Manageability	Meaningfulness		Comprehensibility	Manageability	Meaningfulness		Comprehensibility	Manageability	Meaningfulness	
a	.52***	.60***	.61***		.52***	.60***	.61***		.52***	.60***	.61***	
b	.29**	.54***	.65***		.21*	.35***	.56***		.31**	.35**	.46***	
a × b	.15	.32	.40		.11	.21	.34		.16	.21	.28	
c	.51***	.51***	.51***		.60***	.60***	.60***		.37***	.37***	.37***	
c'	.36***	.19*	.11 <sup>†</sup> ns		.49***	.39***	.26**		.21 <sup>†</sup> ns	.16 <sup>†</sup> ns	.09 <sup>†</sup> ns	

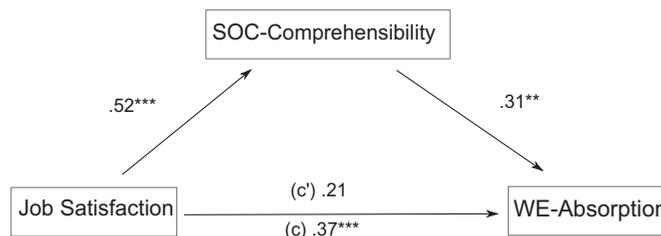
\**p* < .05.

\*\**p* < .01.

\*\*\**p* < .001.

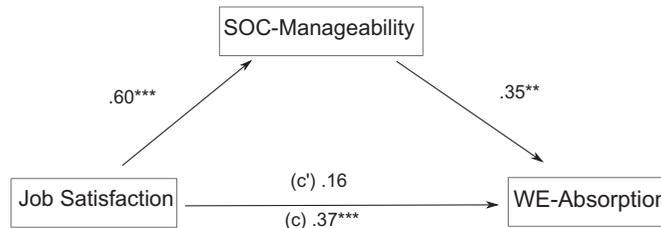
**Figure 5. Model of complete mediation by the component of coherence—comprehensibility and absorption.**

Notes: The indirect effect:  
 $a \times b = .16$ ; (LCI) .051 - (UCI) .321.



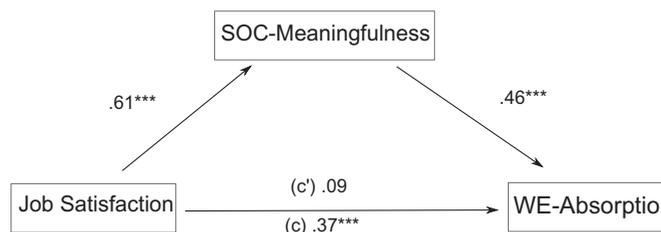
**Figure 6. Model of complete mediation by the component of coherence—manageability and absorption.**

Notes: The indirect effect:  
 $a \times b = .21$ ; (LCI) .098 - (UCI) .370.



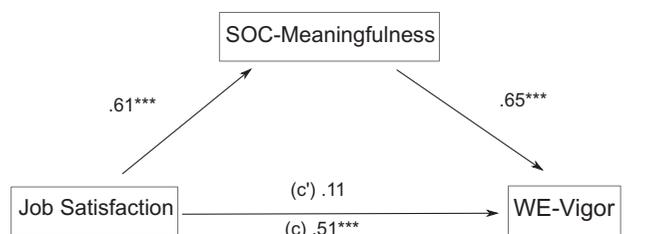
**Figure 7. Model of complete mediation by the component of coherence—meaningfulness and absorption.**

Notes: The indirect effect:  
 $a \times b = .28$ ; (LCI) .124 - (UCI) .480.



**Figure 8. Model of complete mediation by the component of coherence—meaningfulness and vigour.**

Notes: The indirect effect:  
 $a \times b = .40$ ; (LCI) .229 - (UCI) .601.



In turn, vigour is otherwise understood as a high level of energy and resiliency during work, the will to invest effort. A feeling of meaningfulness of work also contributes to this. It is difficult to find the energy for work if one does not feel the meaning of treating work as a challenge.

#### 4. Summary and discussion

Work engagement is positively impacted by all of the variables we have examined. These associations are primarily realized on the affective plane, because engagement is associated with both work satisfaction and resilience, which is based on control of emotions and sense of coherence; under the salutogenetic approach, of particular importance to this is the component of meaningfulness, i.e. the affective and motivational equivalent of the meaningfulness component. In some sense these associations are also realized through a share of personality, if we consider resiliency as one of its characteristics, and sense of coherence as an indicator of psychological structure. Because sense of coherence is also an assessment of the meaningfulness of the structure of stimuli and possessed resources, these associations can also emerge on the cognitive plane. Work engagement is a different construct from work motivation, albeit similar and possessing a dualistic character. It can lead to self-development and so-called Organizational Citizenship Behaviour (OCB), but also to professional burnout. In this paper, emphasis has been placed on the conditions of work engagement.

However, it cannot be excluded that this variable has a reciprocal impact on its predictors and determinants, and in psychology such relations come as no surprise. It cannot be excluded that as a response variable it is causally enmeshed in its own explanatory model. From the perspective of the requirements of mediation analysis, this is not a conducive situation, but it is still worth engaging in analysis; this is similar to the situation occurring in the absence of a total effect between variable X and Y, which can be subject to suppression (Cichocka & Bilewicz, 2010; Hayes, 2009; Trejtowicz & Jaśko, 2010). From the perspective of the analyses reported in this paper, we failed to note the theoretically justified fear that work engagement exerts an influence on sense of coherence. The assumption was confirmed that engagement depends on coherence. Employees have an easier time engaging in a meaningful task with resources they judge to be sufficient than in tasks which they find to be threatening because they are devoid of sensibility, or because of non-acceptance of objectives. Perhaps some variables not examined here are directly associated with work engagement, without the involvement of mediators. However, they may interact with other variables. Then, it would be worth seeking moderators, that is, variables which the force and direction of the association of a given explanatory variable and work engagement depend on.

#### **4.1. Major findings and theoretical implications**

The results recorded indicate a relatively high level of confirmation of the presented hypotheses. Hypothesis 1 concerning the positive link of work satisfaction with work engagement received support in the results of correlation analysis conducted on those variables, with consideration of the components of engagement, regression analysis and examination of the assumption of mediation analysis concerning the correlation of predictor X and response variable Y as expressed in the standardized  $\beta_c$  coefficient.

Hypothesis 2, concerning the positive association of work satisfaction with resiliency and sense of coherence, also found confirmation in the results of correlation analysis; this relation turned out to be stronger for coherence (.63<sup>\*\*\*</sup>) than for resiliency (.32<sup>\*\*\*</sup>). In addition, the analyses of stepwise regression for the dependent variable of resiliency demonstrated that after adding work satisfaction in the second step to coherence, the value of the standardized  $\beta$  coefficient was not statistically significant for satisfaction. For the dependent variable sense of coherence, adding work satisfaction in the second step to resiliency led to a drop in its  $\beta$  coefficient, but for work satisfaction the  $\beta$  coefficient was .45,  $p < .001$ . In the model of mediation M1.1 (coherence—resilience), for the path work satisfaction—resiliency, the value of  $\beta a_2 = -.018$  and is statistically insignificant. Coherence also weakened this link, but resiliency did not weaken the association of work satisfaction—coherence (M1.2), for which  $\beta a_2 = .45$ ,  $p < .001$ . Separate testing of mediators (M2 and M3) indicates the positive association of work satisfaction with resiliency and coherence.

Thus, we may speak of the contextual nature of the link between work satisfaction and resilience, and the stronger association of satisfaction with sense of coherence. Perhaps this is because the measured work satisfaction consisted on a cognitive assessment of work, which is more conducive to a cognitive assessment of a situation as a component of coherence rather than control of Ego, which resiliency is based on. Hypothesis 3, regarding the association between resiliency and sense of coherence with work engagement, was verified save for the correlation with the path examining the assumptions of mediation about the association of intervening variables M and response variable Y with control of variable X, which is expressed in the statistically significant standardized  $\beta_b$  coefficient. At the same time, it turned out that the strongest predictor of work engagement measured globally is work satisfaction, followed by sense of coherence and resilience. Analysis of correlation and mediation with resiliency and sense of coherence as two simultaneous mediators, as well as analysis of mediation for each mediator conducted separately, confirm H3 and H4 about the mediating role of each of them in the relation work satisfaction—work engagement.

The interesting and recurring observation that in the examined association, of more mediating significance is coherence than resilience, may be explained based on the cognitive links between work satisfaction and sense of coherence, which, when activated by a high assessment of work,

facilitates engagement in it. Resilience, in turn, seems to be less strongly associated with cognitive assessment of work, because it is based on affective constructs. Perseverance, openness to experiences, competences, optimism and tolerance for failure as characteristics of resiliency would seem to be more weakly activated by work satisfaction than sense of coherence. This is why resiliency is not as conducive to engagement as strongly activated coherence. On the basis of the broaden-and-build theory of resources (Fredrickson, 2001) we may assume that a high level of work satisfaction has a positive impact, while a low-level exerts a negative influence on sense of coherence, and in turn on work engagement. This, however, requires more study.

It turned out that the best mediator of work satisfaction on work engagement, particularly on its component of absorption, is an affective component of sense of coherence defined as meaningfulness. It would seem that the results generated allow us to make the generalized statement that work engagement depends not only on the level of work satisfaction, but also on dependent sense of coherence and resiliency as mediators of the relation being examined. People occupying independent positions are engaged in their work, particularly in the dimensions of absorption and vigour, if they demonstrate a high level of work satisfaction which activates sense of coherence and resilience.

#### **4.2. Limitations and suggestions for future research**

It cannot be excluded that work engagement may arise outside the mechanism of mediation as a result of the direct influence of the tested predictors, which is indicated by their empirical predictive strength. Of course, other variables which we did not examine have predictive value for work engagement. This means that future studies on engagement will involve a search for moderators of those links. They can be not only personal resources, but also social resources in the form of social support, climate and organizational culture, as well as seemingly banal sociodemographic variables. One limitation of the presented research is the relatively small sample size, which is why we intend to conduct our investigations in various organizations with a larger sample of employees, as well as longitudinally. This will allow for exploration of mediation not only via the regression analysis method, but also with tools for structural equation modelling (SEM).

#### **4.3. Practical implications**

The achieved results can be applied in practice to build a new work environment in which employees perceive the sense of the challenges undertaken, understand them and view their resources as adequate for performance of the task. This is facilitated by appropriate control of Ego, that is, neither excessive restriction nor excessive spontaneity of impulses, but rather regulation appropriate to the situation. If employees occupying independent managerial positions do not have this type of control, recruitment and selection processes can be modified to include relevant personality criteria, emotion regulation training can be conducted or in accordance with the tenets of the JD-R model. An attempt can be made in the organization at optimizing the relations of resources with demands.

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