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Personal Resources, Work Demands and Work Outcomes: A Test of the JD-R Model

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Abstract

The purpose of the study was to evaluate the relationship between personal and organizational demands and resources supported by the Job and Demands Resources (JD-R) model. 252 workers participated, 71% women, mean age 34 years (SD = 12) and mean length of service of 28 months (SD = 16). Data collection was online. Validity scales and a sociodemographic questionnaire evaluated the variables. One question evaluated perception of general health. Descriptive statistics and structural equations were performed for data analysis. The results confirm model adequacy to explain the relationships between organizational phenomena. However, these results are not generalizable. Organizations can take action to improve employee engagement, and by reducing self-reports of health. Interventions on resilience and relationship conflicts would influence levels of engagement, and health reports, bringing return to the institution and well-being and health to workers. We point out limitations and applicability of the results.

Keywords

Work Engagement, Intragroup Conflicts, Self-Efficacy at Work

1. Introduction

The Job-Demands and Resources (JD-R) model (Bakker & Demerouti, 2007) proposes that the integration of relationships between resources and work demands are the basis for understanding work engagement. Work engagement is "a work-related mental state characterized by vigor (…high levels of energy and mental resilience while working), dedication (…sense of importance, enthusiasm and challenge) and absorption (…being focused and happily absorbed in work)" (Schaufeli & Taris, 2014: p. 46).

In this model, personal and work resources are interrelated, and both are predictors of engagement. Work demands would moderate the relationship between these resources and engagement, which is an antecedent of attitudes and behaviors at work, health and well-being and the organizations results (Schaufeli & Bakker, 2022). Work resources are functional physical, and social and organizational aspects for the achievement of objectives, reducing demands and the associated psychological and physiological costs that stimulate the growth and development of employees. They have extrinsic and intrinsic motivational qualities (Schaufeli & Bakker, 2022).

These resources partially mediate the relationship between demands and work engagement (Kotzé & Nel, 2019; Xanthopoulou et al., 2007). They also help achieve goals, reduce work demands, support personal growth (Bakker et al., 2014) and are key predictors of engagement (Porter & Wang, 2022). Job resources and self-efficacy affect engagement, both in the short and long term (4 and 8 months) (Simbula et al., 2011). Decreased work resources result in decreased engagement (Hu et al., 2017).

Personal resources are characteristics of the individual necessary for their commitment and good performance (Bakker et al., 2014). For example, emotional intelligence and self-efficacy are positively related to engagement; self-efficacy moderates the relationship between emotional intelligence and engagement (Mérida-López et al., 2020). Self-efficacy and positive affect are interrelated over time (Laguna et al., 2017). Self-efficacy and optimism have a positive relationship with engagement (Halbesleben, 2010; Tadić-Vujčić, 2019; Xanthopoulou et al. 2007). Other personal resources, such as personality, have also been associated with engagement (Albrecht & Marty, 2017).

However, the JD-R model does not specify the full range of personal and work resources that can impact engagement. In this sense, this study intends to cover part of this gap, studying how individual and work variables influence the vigor, absorption, and dedication of workers to the work they perform. In addition, it seeks to clarify whether this set of variables has an impact on self-reported health.

This article is structured in six topics. In the Introduction, presented above, the subject was presented. In the topic reserved for the Literature Review, the main findings on the variables involved in this study are revealed. In the section called Method, the way in which the study was carried out and how the data were analyzed is presented. In the Results section, the analysis findings are revealed and interpreted. In the Discussion, the results are compared and discussed with the literature and possible reasons for the differences between the results of this and other studies are presented. Finally, in the Conclusion, the findings of the study are briefly presented, their collaborations are pointed out and suggestions for future studies are offered. The Literature review will be described below.

2. Literature Review

The JD-R model states that individual and job resources explain engagement. However, perhaps because it is still a recently proposed model, the model does not specify all variables classified as personal and work resources. Although there is a wide range of studies that use this model, none covers them all, because there are a very large number of personal and other resources that can be classified as work resources.

The literature referring to personal resources points out some personal resources that have emerged as predictors of engagement. For example, locus of control at work, psychological capital (PsyCap) and vocation were good predictors of work engagement (Vermooten et al., 2021); proactivity, self-efficacy and reflexivity were more powerful predictors of engagement than optimism and assertiveness (Contreras et al., 2020). Self-efficacy and optimism help redesign work and thus improve engagement (Tadić-Vujčić, 2019). Over time (three years later), self-efficacy predicts work engagement, and perceptions of the social context of work mediate the relationship between self-efficacy and engagement (Consiglio et al., 2016). PsyCap directly influences perceptions of work demands and resources and well-being and engagement outcomes (Nordin et al., 2019).

Personal resources can also moderate the relationships between job demands and resources. Chen's (2021) study, for example, reveals that personal resources (self-efficacy, optimism, and self-esteem) weaken the negative effects of work demands on engagement. PsyCap directly influences perceptions of work demands and resources, well-being, and engagement and demands (Grover et al., 2018).

However, personal resources can also function as mediators. For example, the study by Carmona-Halty et al. (2021) revealed that PsyCap (optimism, self-efficacy, resilience, and hope) and academic engagement mediated the relationship between positive emotions and academic performance. They can also function as mediators of the relationship between job characteristics and engagement. Kotzé and Nel (2019) identified that PsyCap and mindfulness mediate the relationship between work demands and work engagement.

Xanthopoulou et al. (2007) found that self-efficacy, optimism, and organization-based self-esteem partially mediated the relationship between job resources and engagement. Furthermore, work demands and resources mediate the relationship between psychological capital and well-being and engagement, respectively, reinforcing the role of personal resources in the JD-R model (Grover et al., 2018).

Engagement is also a predictor of some variables. Simbula et al. (2011) further identified that engagement increases efficacy beliefs associated with increased task resources over time. They also found an association between engagement and elevated levels of effectiveness over time. These results point to the significant role of efficacy beliefs in engagement (Schaufeli & Taris, 2014).

Personal resources also play a key role in the perception of job characteristics.

In 2020, in a literature review, Hardaningtyas (2020) investigated the mediating effects of work engagement on the relationships between personal resources (self-efficacy, organizational self-esteem and optimism) and turnover intention. The results indicated the existence of a positive relationship between self-efficacy, organizational self-esteem, optimism and engagement at work. This study verified the mediating role of work engagement in the relationship between self-efficacy, self-esteem based on the organization, optimism, and turnover intention.

On the other hand, the demands of work are physical, social, and organizational aspects that require physical or mental effort associated with physiological or psychological costs. Few studies investigate work demands. Among the demands are the bases of social power that can be classified as soft (experience, legitimacy and reference) or hard (reward and coercion). Soft bases are associated with positive results, while hard bases are associated with negative results (Park, 2019).

The soft bases of power had a positive impact on organizational engagement (Jalilvand & Vosta, 2015), on conflicts and influence within groups or organizations (Johnson & Scollay, 2000), on satisfaction and performance of subordinates (Johnson & Payne, 1997) and engagement at work (Park, 2019). These bases are more used by managers in less rigid, long-term oriented, low power distance, collectivist and uncertainty avoidance cultures, while hard bases of power are used more frequently in closed and short-term oriented cultures and with great power distance (Mittal & Elias, 2016).

Another work demand is the intragroup conflict, classified as cognitive or task and affective or relationship. Studies reveal its negative role on well-being at work and stress (Mittal & Elias, 2016) and on one of the dimensions of engagement, vigor (Tafvelin et al., 2020). They also show its positive association with stress, professional exhaustion, and depression (Tafvelin et al., 2020).

Costa et al. (2015) identified a positive influence of task conflict on team engagement, as well as the moderating role of relationship conflict that weakened the relationship between resources and team engagement, while task conflict strengthened the relationship between engagement and team's performance. Esbati and Korunga (2021) did not identify a negative relationship between task conflict and engagement. However, they identified that higher levels of relationship and task conflicts are positively associated with emotional exhaustion and negatively associated with work participation.

Thus, relationships between demands and engagement depend on the type of demand. There are two categories of work demands, challenges and impediments. The challenges are overload, time pressure and responsibility, while the impediments would be role conflicts, role ambiguity and bureaucracy. Barrier demands are negatively related, while challenging demands are positively related to engagement (Schaufeli & Taris, 2014).

Consistently, studies reveal that engaged workers have better health (Seppälä et al. 2012), are more active and report more positive emotions (Diener et al.,

2020), and behave more proactively (Parker & Griffin, 2011). Schaufeli et al. (2009) identified that job demands and workaholism predict role conflicts and that these conflicts inversely predict well-being and directly predict burnout.

These findings reveal that the JD-R model performs well in predicting relationships between work demands and resources, personal resources, and work and work outcomes. Despite this, few studies in Brazil use this model. Therefore, this model was adopted to answer the research question of this study: Work resources (supervisor power bases) and personal resources (resilience and self-efficacy at work) predict engagement, and this relationship explains self-report of general health? Does the presence of conflicts (labor demands) change the relationship between work resources and personal resources?

The hypotheses derived from this research model are presented in the Results section when reporting their acceptance or rejection. The following will be presented Method of this study.

3. Method

3.1. Participants

299 workers participated in the study, but only 252 met the minimum teamwork criteria for at least 6 months of work experience.

These participants do not represent the population of Brazilian workers because, as Brazil is a country of continental dimensions, the population of workers is around 30 million people. Furthermore, the sample was voluntary. So, for a total of 957 workers who received the link to respond to the survey, Cochran's (1970) formula reveals that the sample should be 273 people ($p < 0.05$, 95% confidence level, 0.05 ratio).

As can be seen in **Table 1**, from the valid total of participants, most are women, almost half are married, more than half have a university degree, they did not hold a managerial position, they worked in small companies, and most work in the supplier service. They were young workers, with few children. They worked in little teams, and they had they have little work experience. The vast majority claim to be in good health (71%), although all declare some health problem.

3.2. Instruments

Self-efficacy at Work Scale (EAET) (Martins & Siqueira, 2010). In this study, based on confirmatory factor analysis, the six-item EAET revealed a unique factor and acceptable goodness of fit indicators (X^2 = 7.40, DF = 7; X^2/DF = 1.06, GFI = 0.99, AGFI = 0.97, CFI = 1.00, RMSEA = 0.05). Reliability (Cronbach's α) was 0.90.

Supervisor Power Bases Scale (EBPS) (Martins, 2008). Consisting of 20 items distributed by five bases (reference, α = 0.86, expertise, α = 0.92, coercion, α = 0.66, reward, α = 0.80 and legitimate, α = 0.88). In this study, based on confirmatory factor analysis (CFA), the EBPS revealed good fit indices (X^2 = 7.40, DF = 7; X^2/DF = 1.06, GFI = 0.88, AGFI = 0.85, CFI = 0.95, RMSEA = 0.06).

Table 1. Characteristics of the participants (n = 252).

Variable		Mean	SD	Percentage
Age		34	12	
Number of children		1	1	
Length of service (in years)		7	11	
Number of people on the team		12	13	
Number of people that the participant leads		14	47	
Length of service (in years)		16	23	
Length of service at current company (in years)		6	7	
Number of people in the workgroup (in years)		12	13	
Sex	Man			29
	Woman			71
Managerial position	Yes			29
Education levels	High school			3
	University education			52
	Postgraduate studies			45
Marital status	Married			43
	Single			48
	Divorced			9
Number of company employees	Until 20			10
	Between 21 and 49			9
	Between 50 and 99			5
	Between 100 and 499			13
	More than 500			38
Health problem	Arthritis			5
	Asthma			4
	High cholesterol			5
	Chronic back pain			15
	Migraine			16
	Hypertension			5
	Depression and anxiety			5
	Other problems			45

Continued

Smoker		5
Alcohol consumption		6
Shortness of breath in last year		40
Business branch	Service providers	54
	Commerce	17
	Industry	3
	missing	26

Source: The authors.

Intragroup Conflict Scale (ICS) (Martins et al., 2014). The ECI has two factors that group nine items: relationship conflict with five items (α = 0.85) and task conflict with four items (α = 0.89). In this study, CFA confirmed the bifactorial structure and good fit indices (X^2 = 39.77, DF = 22; X^2/DF = 1.81, GFI = 0.96, AGFI = 0.93, CFI = 0.99, RMSEA = 0.06).

Scale of Resilience at Work (Siqueira & Martins, 2010). It consists of seven items and has a good reliability indicator (α = 0.80). In this study, the CFA revealed one factor with good fit indexes (X^2 = 9.52, DF = 5; X^2/DF = 1.90, GFI = 0.96, AGFI = 0.92, CFI = 0.9, RMSEA = 0.06).

Ultrecht Work Engagement Scale (UWES) (Schaufeli & Bakker, 2003). Study by Seppälä et al. (2009) reveals a robust one-factor structure for the nine-item reduced form. In this study, the reduced form of nine items showed a good fit (X^2 = 53.36, DF = 24; X^2/DF = 2.22, GFI = 0.99, AGFI = 0.95, CFI = 0, 98, RMSEA = 0.07) and a good reliability index (α = 0.90).

The Occupational Health Questionnaire is a self-report instrument constructed for this study with the objective of obtaining information about the worker's perception of health. It consists of seven questions about health and health perception. A question about how the respondent considered his health, answered on a five-point scale (from very poor to excellent), collected information about general health. The others were informative about the presence or absence of diseases, the quality of sleep, the type of disease they suffered, whether they were a smoker or not, and served to describe the interviewees.

To obtain sociodemographic information from the participants, a questionnaire was constructed that sought information on age, marital status, education, academic training, supervision, coordination or submission, group or teamwork, working time and training.

3.3. Procedures

Data collection and ethical care:

The Ethics Committee (CEP) of the Methodist University of São Paulo approved the project (CAAE: 47897615.7.0000.5508, Opinion CEP n˚1.210.294).

The distribution and collection of research instruments was electronic through Google Forms. Participants were invited through the researcher's electronic professional contacts, totaling more than 2500 people.

A small invitation with the survey link was sent to potential participants explaining its objectives. There were detailed explanations about the project, followed by the Informed Consent Form and the study questionnaires in electronic format. Only people who agreed to participate by checking the "I ACCEPT" box in the electronic Informed Consent Form had access to the instruments. The responses were automatically saved in a database Excel and then processed in SPSS (IBM, 2013a). And AMOS 22.0 (IBM, 2013b). 957 participants actually received the link to respond to the survey questionnaire 299 questionnaires were returned, representing 31% of the invitations sent.

3.4. Data Analysis

Data processing was performed using SPSS 22.0 (IBM, 2013a) and AMOS 22.0 (IBM, 2013b). Initial preliminary analyzes were performed to clean the database, when missing values, univariate and multivariate extreme cases were observed. The presence of multivariate outliers was analyzed by observing the Mahalanobis distance. Multicollinearity was verified using the variance inflation factor (VIF) and statistical tolerance in SPSS (Marôco, 2014).

Confirmatory factor analyzes and structural modeling equations were used to assess the validity of the theoretical model, with parameter estimation using the maximum likelihood (ML) method (Arbuckle, 2013). As a satisfactory adjustment criterion, values of the χ^2/df indicator smaller than 5 were adopted; CFI, and GFI adherence indices with values close to or greater than 0.90, RMSEA close to or less than 0.08, and SRMR less than 0,08, as recommended by Arbuckle (2013) and Marôco (2014).

The results of the study will be presented below in the topic Results.

4. Results

In the proposed model, it was assumed that personal resources (there is a relationship between self-efficacy and resilience at work) and work resources influence work engagement, and that work demands moderate the relationship between personal resources and work engagement, and that engagement influences work outcomes, for the individual (self-assessed health). The hypotheses assumed derive from the model and from the references made explicit in the bibliographic review presented.

The first analyzes revealed that task conflict does not explain work engagement ($\beta = 0.07$, $p > 0.05$) and that relationship conflict does not moderate the relationship between resilience and work engagement, because when it enters as a predictor isolated, presents $\beta = -0.26$ ($p < 0.01$). When the interaction between relationship conflict (CR) and resilience was added, the beta of the CR dropped to −0.24 and the interaction variable relationship conflict with resilience had a

Beta of −0.05 ($p > 0.05$). However, in all options, the model's goodness of fit indices were not acceptable ($\chi^2 = 129.03$, DF = 38; χ^2/DF = 3.39, GFI = 0.92, AGFI = 0.83, CFI = 0.90, RMSEA = 0.10 for the model with conflicts $\chi^2 = 757.64$, DF = 38, χ^2/DF = 19.94, GFI = 0.81, AGFI = 0.61, CFI = 0.54, RMSEA = 0.27 for the model with conflicts and interaction between CR and resilience).

Taking into account that the JD-R model is relatively new and studies about it led to results that are not yet generalizable, two re-specifications were made in the model based on the covariance observed in the resulting model, indicated in the literature, as will be discussed below in section appropriate. Consequence relationships were established between the two types of conflicts and engagement, since, if they are not moderators, it is possible to assume that they are antecedents of this variable. It was also established that relationship conflict is a direct antecedent of self-reported health, as indicated in the model modification indices. Thus, it is acceptable to expect that few relationship conflicts (CR) can explain greater health reports, while high CR rates explain less health reports. This re-specified model (Figure 1) was tested and presented acceptable fit indices: $\chi^2 = 29.46$, DF = 12; χ^2/DF = 2.45, GFI = 0.97, AGFI = 0.93, CFI = 0.96, RMSEA = 0.08, SRMR = 0.06.

Examination of Figure 1 shows that seven of the thirteen hypotheses derived from the model were confirmed (H1, H2, H3, H4, H8, H10, and H12), as detailed below, while H5, H6, H7, H9, H11 and H13 were rejected.

H1: Personal resources (self-efficacy and resilience), work resources (power bases (reward power) and work demand (relational conflict) explain work engagement ($R^2 = 0.21$, $X^2 = 29.46$, DF = 12, $p < 0.01$) Hypothesis accepted.

H2: The model that brings together self-efficacy at work, resilience at work, intragroup conflicts, hard power bases and engagement explains self-reports of health. Hypothesis accepted ($R^2 = 0.12$, DF = 12, $p < 0.01$).

H3: Self-efficacy at work explains resilience at work ($\beta = 0.61$, $p < 0.01$), so self-efficacy is positively associated with resilience at work. Hypothesis accepted.

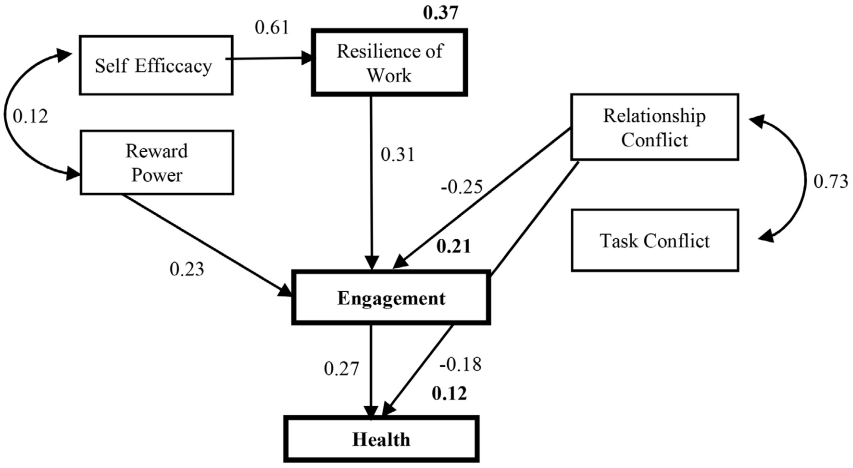

Figure 1. Pictorial specification of the model of relationships between variables (standardized values). Source: The authors.

H4: Resilience at work explains engagement at work (β = 0.31, $p < 0.01$), so that more resilient workers show more commitment. Hypothesis accepted.

H5: Soft bases of power (expertise, β = 0.14, $p > 0.05$; legitimacy, β = −0.01, $p > 0.05$ and reference, β = −0.03, $p > 0.05$) explain engagement at work, being positively associated with it. Hypothesis rejected.

H6: Hard bases of power (coercion, β = −0.04, $p > 0.05$ and reward, β = 0.20, $p < 0.01$) explain engagement at work, so that both are linked to a decrease in work employee engagement. Hypothesis rejected.

H7: Intragroup conflicts moderate the relationship between personal resources and engagement (β = 0.05, $p > 0.05$), thus diminishing the positive role of personal resources in explaining engagement. Hypothesis rejected.

H8: Engagement at work directly explains self-rated general health (β = 0.27, $p < 0.01$), so that the more engaged the workers, the better the levels of health reported. Hypothesis accepted.

H9: Power bases are associated with self-efficacy, so when they perceive soft power bases (expertise, r = −0.01, $p > 0.05$; reference, r = 0.08, $p > 0.05$ and legitimacy, r = 0.09, $p > 0.05$), employees are more self-effective and vice versa. When they perceive hard bases of power (coercion, r = 0.09, $p > 0.05$ and reward, r = 012, $p > 0.05$), are less self-effective and vice versa. Hypothesis rejected.

H10: Relationship conflicts explain self-reports of health, in such a way that employees who perceive relationship conflicts, report lower levels of health. Accepted hypothesis (β = −0.17, $p < 0.01$).

H11: Task conflicts explain self-reports of health, in such a way that employees who perceive task conflicts, report higher levels of health. Hypothesis rejected (β = 0.02, $p > 0.05$).

H12: Relationship conflicts explain engagement, such that employees who report emotional intragroup conflicts report lower engagement (β = −0.25, $p < 0.01$). Hypotheses accepted.

H13: Task conflicts explain engagement, such that the presence of these conflicts decreases the level of engagement at work (β = 0.05, $p > 0.05$). Hypothesis rejected.

The model that combined reward power (work resource), self-efficacy and resilience (personal resources at work) and intragroup relationship conflict (work demand) explained 21% of the variance in work engagement ($p < 0.01$), corroborating the JD-R model, with acceptance of H1. When engagement was associated with resources and demands as predictors, the model explained 12% of the variation in self-reported health. Although not all the resources of the work were confirmed as predictors, the JD-R model was confirmed in this study, even if the role of power bases was not confirmed, as will be discussed later.

Personal competence beliefs are important for workers to know how to deal with adverse situations at work (H3), without losing their structure, taking advantage of them to learn and grow with the opportunities they can offer, despite the suffering they imply. Workers who know how to deal with difficulties at

work, on the other hand, have more energy, more willingness to work, are more concentrated, more energetic, more involved, more dedicated, in short, more committed to what they do, so they are those more resilient at work from whom higher levels of engagement can be expected (H4).

No soft power base was a significant predictor of engagement (H5). The significant and negative role of hard power bases as predictors of engagement (hypothesis H4) was confirmed because, in addition to the fact that the coercion base was not a significant predictor, the reward base turned out to be a direct and significant predictor of engagement. That is, the use of this base by the superior predicted greater engagement of subordinates (H6).

Although task and relationship conflicts were not confirmed as moderators of the relationship between personal resources and engagement, rejecting H7, relationship conflict was a significant and negative predictor of engagement (H12), revealing that conflicts involving emotional levels decrease concentration, the vigor, involvement, and dedication of the workers. Relationship conflict was also a significant and inverse predictor of health; thus, this type of conflict explains the lower levels of self-rated health (H10). As can be seen in **Figure 1**, task conflict was not a statistically significant predictor of any consequent variable in the model, including engagement.

Engaged, focused workers, with good levels of energy, enthusiasm and resistance are more involved and dedicated, report better health (H6) and less intention to leave the organization (H7).

In general, the JD-R model (H8) was confirmed: personal resources, work resources and work demands predict work engagement, although the initial model of this study predicted that work demands (conflicts) would moderate the work engagement and relationships and engagement has not been confirmed, as only relationship conflict was a predictor and not a moderator of engagement. However, this study did not differentiate challenging demands from impeding demands.

There is a correlation between power bases and self-efficacy (SE), but the relationship found does not confirm H9, which states that the correlations between soft bases and SE are direct, and between hard bases and SE would be inverse. What was found was a single significant and direct relationship between a hard base (reward) and SE, revealing that when the boss uses mean to reward the subordinate, the subordinate is more dedicated to work, using more energy, vigor, becoming more focused and happier to work and vice versa.

Table 2 shows the indirect effects of the antecedent variables on the consequent variables of the model obtained by testing the model using structural equation modeling (SEM). Of the total indirect effects, only the effect of self-efficacy at work on engagement was statistically significant. Reward power base has a small indirect effect on self-reported health.

Relationship conflict confirms its negative influence on health reporting. On the contrary, self-efficacy and resilience at work maintain their role as positive,

Table 2. Standardized indirect effects of antecedent variables on consequent variables.

	Task Conflict	Emotional Conflict	Reward power base	Self-efficacy at Work	Resilience at Work	Engagement
Resilience at work	0.00	0.00	0.00	0.00	0.00	0.00
Engagement	0.00	0.00	0.00	0.19*	0.00	0.00
Health	0.01	−0.07	0.06	0.05	0.08	0.00

*$p < 0.05$. Source: The authors.

albeit indirect, predictors of good outcomes: self-efficacy is an indirect predictor of engagement and resilience indirectly predicts self-reported health. The discussion of the results is presented in the sequence of this text.

5. Discussion

The description of the participants reveals a curious fact: although all reported some health problem, almost 80% said they were in good health, which reveals that there seems to be no relationship between real health problems and how people feel. Perhaps the youth of the group led them to declare themselves healthy, despite the number of declared pathologies. Participants were also inexperienced in the role: they had, on average, 28 months of experience.

The hypotheses were based on the JD-R model and on studies on the relationships between variables considered as work demands, personal resources and work resources and were discussed based on the literature reviewed for this study.

The results found confirm the JD-R model, which corroborate that personal resources, work resources and work demands predict engagement, as proposed by the positive perspective in the model presented by Schaufeli and Taris (2014). Some characteristics of the work, such as the soft bases of power, were removed from the final model because they did not reveal predictive power, contrary to the results in the literature (Martins, 2015) which, however, referred to results other than engagement.

This study corroborated that engagement mediates the relationship between the emotional conflict and self-reported health, in addition to directly predicting this outcome (self-reported health).

The model by Schaufeli and Taris (2014) does not refer to the role of personal resources in explaining engagement but emphasizes the motivational qualities of work resources. The model assumes that personal resources, extrinsically or intrinsically motivate workers, stimulating their engagement, promoting positive results, mediating or moderating the relationship between work resources and its results. Thus, motivation would be a personal resource triggered by a work resource and perhaps the first reference to the role of personal resources in the model began there.

The study presented here focuses on two personal resources highly intercorrelated: self-efficacy and resilience. However, in this study, resources or work demands had no influence on them. Nonetheless, self-efficacy indirectly influenced engagement, and both indirectly influenced self-reported health confirming the findings of Xanthopoulou et al. (2007) that personal resources, together with work resources, predict engagement at work and Böttcher and Monteiro (2021) who identified that personal resources predict engagement. Nordin et al. (2019) identified the role of self-efficacy as an antecedent of engagement in a study with the four personal resources that make up the concept of Psychological Capital (PsyCap): self-efficacy, optimism, hope and resilience. Self-efficacy has also appeared in the literature as a mediator of the relationship between task resources and engagement (Simbula et al., 2011; Xanthopoulou et al., 2007), which is not the case in this study. There seems to be a consensus in the literature that self-efficacy beliefs play a significant role in engagement (Consiglio et al., 2016; Schaufeli & Taris, 2014). In our model, self-efficacy plays a significant role in resilience and appears as an indirect predictor of engagement.

Conflicts did not play a moderating role in this study, contrary to the results by Schaufeli et al. (2009) who identified that relationship conflicts strengthen the relationship between work demands and engagement, while task conflicts weaken it. However, our results confirmed part of the results of these authors who revealed that relationship conflicts negatively influence engagement at work.

This study revealed that task conflict was not a predictor of any consequential variable in the model, but relationship conflict predicted (inversely) engagement, and perceived health, confirming that conflicts (at least affective ones) function as restraining orders. In this way, conflicts involving emotions reveal a negative role in outcome variables such as engagement, and health perception.

Study by Costa et al. (2015) identified the positive role of task conflicts in performance and team engagement and the moderating role of relationship conflict, which weakened the relationship between resources and team engagement, while task conflict strengthened the relationship between engagement and team performance. Contrary to the results of our study, task conflict did not play a relevant role, while the role of relationship conflict corroborated the negative results of Costa et al., not as a moderator, but as a negative predictor of engagement. That is, workers who face relationship conflicts have lower levels of engagement at work.

In the same sense, Esbati and Korunka (2021) identified that higher levels of relational and task conflicts are positively related to emotional exhaustion and negatively related to engagement at work, and Tafvelin et al. (2020) reveal its negative role in one of the dimensions of engagement, vigor, and its positive association with stress, exhaustion, and depression in employees. Thus, the literature still does not reveal a consensus on the effects of task conflict on engagement, but studies more consistently point to the negative influence of relationship conflict on this phenomenon, which was corroborated by this study.

Soft power bases are associated with positive outcomes, while hard power bases are associated with negative outcomes. In this sense, the results of our study confirm these notes in the literature. In this study, a hard base (reward) was a predictor of engagement, which contradicts previous findings. A study by Park (2019) identified that no hard base of power was a significant predictor of engagement, contradicting the results of our study. However, Park found that soft bases (expertise and referral) predicted engagement. These soft bases have also are identified as predictors of engagement (Jalilvand & Vosta, 2015), conflicts and influence within groups or organizations (Johnson & Scollay, 2000), satisfaction and subordinate performance (Johnson & Payne, 1997). The study by Mittal and Elias (2016) reveals that soft bases are more used by managers in collectivist cultures, less rigid, long-term oriented, with little distance from power and avoidance of uncertainty, while hard power bases are more used in closed environments, short-term oriented cultures, and high-power distance. So, perhaps culture can explain our results. Brazil is not a collectivist culture like that of the Asians or as individualistic as the United States, for example. In addition, the frequent economic crises that Brazil goes through may be related to this association between reward power and engagement, that is, in this study, the more the employee perceived that his boss had the power to reward him, the greater his work engagement. Finally, work engagement predicted perceived health, confirming the results of Seppälä et al. (2012) that engaged workers have better health. In general, work resources are the main predictors of engagement, as identified in the study by Radic et al. (2020).

Variables in this study were at the individual level, and while some were not predictors of engagement (most power bases and task conflict), all others were. Nor was the moderation or mediation of self-efficacy confirmed, as revealed by previous studies such as those by Simbula et al. (2011) and by Xanthopoulou et al. (2007). However, self-efficacy revealed a significant role as an antecedent of the previous relationship line for resilience, engagement, and health perception.

In general, it can be said that employees with more self-efficacy beliefs are more resilient, have more engagement, and perceive themselves to be in better health. On the other hand, those who face more relationship conflicts have less engagement, worse perception of health, and what feels rewarded, presents more engagement.

Thus, the JD-R model adopted to answer the research question of this study performed relatively well at predicting relationships between personal resources and worker outcomes but did not confirm that job resources (power) predicted any job outcomes, and conflict was shown to be a predictor rather than a moderator. There are gaps to investigate in terms of other levels of resources and personal and work demands to exhaust the possibilities of the model, especially in Brazil where it is still little applied. Nevertheless, the few investigations that used it as an explanatory model reveal its usefulness to explain the relationship between the multiple variables that coexist in the complex organizational context.

The next topic, Conclusion, will present the main conclusions, contributions, critical points of this study and notes for future investigations.

6. Conclusion

This study aimed to evaluate a relationship pattern between demands and personal and organizational resources supported by the JD-R model and, as such, it achieved its objective. The results allowed us to conclude on the usefulness of the model, although some variables, such as soft bases and most hard bases of power, were not antecedents of engagement in this sample and conflicts were not moderators of the relationship between antecedents of the model and engagement at work. However, the JD-R model proved to be quite applicable in explaining organizational phenomena.

Among the study participants, a network of relationships between demand variables and individual resources was clarified by results. The confirmed model can stimulate further studies with other populations, with the aim of deepening knowledge about the relationships investigated here.

From the variables addressed in this study, some are little studied in Brazil. The role of resilience at work needs to be better clarified, especially nowadays, where the world faces many adversities in the work context, whether due to adverse events or more permanent changes in the occupational world. Self-efficacy already proved to be fundamental for human life and this study showed its relationship with resilience and a series of previous relationships that lead to engagement, and self-information about health.

On the other hand, relationship conflicts, predictors of engagement and other outcome variables deserve attention, but also task conflicts which, although not predictors of dependent variables, show a high correlation with relationship conflicts. The deepening of studies on interpersonal conflicts within organizations in Brazil deserves to be highlighted, given the small number of studies identified and the importance of the phenomenon between groups and its impact revealed by the studies cited in the reviewed literature.

Although one cannot generalize from the results of this study, organizations have good indications for action to improve employee engagement, alleviate self-reports of health. Acting to reduce conflicts and improve self-efficacy is possible and influences levels of engagement and health reports, bringing financial return to the institution and well-being and health for workers.

Despite the good results, this study had limitations. The number of participants could have been larger and more gender balanced, as more than 70% of them were women with higher education and young people. These characteristics may have affected the results. However, these are limitations of studies that work with voluntary samples.

Another limitation was the reported health status: 79% said they were in good, very good or excellent health, although they also reported various health problems. It was also not investigated whether the participants would face difficulties

at work or in life at the time of the investigation. As one of the variables investigated was resilience, there are many discussions about collecting data on resilience when participants are not at risk, as was the case in this study. Therefore, the study should have collected information about this.

The complexity of the model brought methodological difficulties and cost a lot of analysis time. Simpler models can bring more modest but more direct conclusions.

Based on the limitations mentioned, we suggested that future studies adopt the JD-R model as a theoretical basis for explaining the relationships between variables in the organizational context; Try to balance the number of participants of both sexes in the sample and represent age in terms of distribution in society. If they study resilience, collect information about the difficulties they are currently experiencing and only include in the sample those participants who say they are currently facing adversity. We further suggest that they be investigate simpler models and a greater number of variables of demands and work resources, clarifying the role of personal resources as mediators or moderators of relationships with engagement.

We recommend that organizations pay attention to the possibility of managing self-efficacy, resilience (through training) and reward and conflict management policies, especially affective ones.

Based on these considerations, this study was original and brought important contributions to the area, clarifying how the JD-R model behaved to explain relationships in a Brazilian sample.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

Albrecht, S. L., & Marty, A. (2017). Personality, Self-Efficacy and Job Resources and Their Associations with Employee Engagement, Affective Commitment and Turnover Intentions. *The International Journal of Human Resource Management, 31,* 657-681. https://doi.org/10.1080/09585192.2017.1362660

Arbuckle, J. (2013). *AMOS 22 User's Guide*. IBM Corporation.

Bakker, A. B., & Demerouti, E. (2007). The Job Demands-Resources Model: State of the Art. *Journal of Managerial Psychology, 22,* 309-328. https://doi.org/10.1108/02683940710733115

Bakker, A. B., Demerouti, E., & Sanz-Vergel, A. I. (2014). Burnout and Work Engagement: The JD-R Approach. *Annual Review of Organizational Psychology and Organizational Behavior, 1,* 389-411.

https://doi.org/10.1146/annurev-orgpsych-031413-091235

Böttcher, E., & Monteiro, J. K. (2021). Engajamento no trabalho em gestores: Influência de recursos pessoais e do trabalho. *Revista Psicologia, Organizações e Trabalho, 21,* 1327-1335. https://doi.org/10.5935/rpot/2021.1.19678

Carmona-Halty, M., Salanova, M., Llorenz, M., & Schaufeli, W. B. (2021). Linking Positive Emotions and Academic Performance: The Mediated Role of Academic Psychological Capital and Academic Engagement. *Current Psychology, 40,* 2938-2947. https://doi.org/10.1007/s12144-019-00227-8

Chen, I.-S. (2021). The Moderating Role of Personal Resources in the Relationship between Job Demands and Work Engagement. *Psihologija, 55,* 123-136.

Cochran, W. G. (1970). *Sampling Techniques* (3rd ed.). Wiley.

Consiglio, C., Borgogni, L., Di Tecco, C., & Schaufeli, W. (2016). What Makes Employees Engaged with Their Work? The Role of Self-Efficacy and Employee's Perceptions of Social Context over Time. *Career Development International, 21,* 125-143. https://doi.org/10.1108/CDI-03-2015-0045

Contreras, F., Espinosa, J. C., & Esguerra, G. A. (2020). Could Personal Resources Influence Work Engagement and Burnout? A Study in a Group of Nursing Staff. *SAGE Open, 10,* 1-12. https://doi.org/10.1177/2158244019900563

Costa, P. L., Passos, A. M., & Bakker, A. B. (2015). Direct and Contextual Influence of Team Conflict on Team Resources, Teamwork Engagement, and Team Performance. *Negotiation and Conflict Management Research, 8,* 211-227. https://doi.org/10.1111/ncmr.12061

Diener, E., Tapa, S., & Tay, L. (2020). Positive Emotions at Work. *Annual Review of Organizational Psychology and Organizational Behavior, 7,* 451-477. https://doi.org/10.1146/annurev-orgpsych-012119-044908

Esbati, Z., & Korunka, C. (2021). Does Intragroup Conflict Intensity Matter? The Moderating Effects of Conflict Management on Emotional Exhaustion and Work Engagement. *Frontiers in Psychology, 12,* Article ID: 614001. https://doi.org/10.3389/fpsyg.2021.614001

Grover, S. L., Teo, S. T. T., Pick, D., Roche, M., & Newton, C. J. (2018). Psychological Capital as a Personal Resource in the JD-R Model. *Personnel Review, 47,* 968-984. https://doi.org/10.1108/PR-08-2016-0213

Halbesleben, J. R. (2010). A Meta-Analysis of Work Engagement: Relationships with Burnout, Demands, Resources, and Consequences. In A. B. Bakker, & M. P. Leiter (Eds.), *Work Engagement: A Handbook of Essential Theory and Research* (Vol. 8, pp. 102-117). Psychology Press.

Hardaningtyas, R. T. (2020). Personal Resources and Turnover Intention among Private Sector Employees: Do Work Engagement Still Matter? *Jurnal Ilmiah Bidang Akuntansi dan Manajemen, 17,* 1-18. https://doi.org/10.31106/jema.v17i1.4989

Hu, Q., Schaufeli, W. B., & Taris, T. W. (2017). How Are Changes in Exposure to Job Demands and Job Resources Related to Burnout and Engagement? A Longitudinal Study among Chinese Nurses and Police Officers. *Stress and Health, 33,* 631-644. https://doi.org/10.1002/smi.2750

IBM (2013a). *IBM SPSS Statistics for Windows, Version 22.0*. IBM Corp.

IBM (2013b). *SPSS AMOS for Windows. Version 22.0*. IBM Corporation.

Jalilvand, M. R., & Vosta, L. N. (2015). Examining the Relationship between Managerial Power and Affective Organizational Commitment. *Sport, Business and Management, 5,*

344-364. https://doi.org/10.1108/SBM-04-2011-0041

Johnson, P. E., & Payne, J. (1997). Power, Communicator Styles, and Conflict Management Styles: A Web of Interpersonal Constructs for the School Principal. *International Journal of Educational Reform, 6,* 40-53. https://doi.org/10.1177/105678799700600105

Johnson, P. E., & Scollay, S. J. (2000). School Based Decision-Making Councils: Conflict Leader Power and Social Influence in the Vertical Team. *Journal of Educational Administration, 39,* 47-66. https://doi.org/10.1108/09578230110380733

Kotzé, M., & Nel, P. (2019). Job and Personal Resources as Mediators in the Relationship between Iron-Ore Mineworkers' Job Demands and Work Engagement. *SA Journal of Human Resource Management*, *17,* a1183. https://doi.org/10.4102/sajhrm.v17i0.1183

Laguna, M., Razmus, W., & Żaliński, A. (2017). Dynamic Relationships between Personal Resources and Work Engagement in Entrepreneurs. *Journal of Occupational and Organizational Psychology, 90,* 248-269. https://doi.org/10.1111/joop.12170

Marôco, J. (2014). *Análise de equações estruturais*. Report Number.

Martins, M. C. F. (2008). Bases do poder organizacional. In M. M. M. Siqueira (Ed.), *Medidas do Comportamento Organizacional* (pp. 21-28). Artmed.

Martins, M. C. F. (2015). Resiliência e autoeficácia no trabalho: O papel do poder e dos conflitos. In *Congresso Norte Nordeste de Psicologia* (Vol. 1, pp. 762-763). Universidade Federal da Bahia.

Martins, M. C. F., & Siqueira, M. M. M. (2010). *Escala de autoeficácia no trabalho*. (Relatório de pesquisa). Universidade Metodista de São Paulo, São Bernardo do Campo.

Martins, M. C. F., Zornoza, A., & Peiró, J. M. (2014). Conflitos no Ambiente Organizacional. In M. M. M. Siqueira (Ed.), *Novas Medidas do Comportamento Organizacional* (pp 132-146). Artmed.

Mérida-López, S., Extremera, N., & Sánchez-Álvarez, N. (2020). The Interactive Effects of Personal Resources on Teachers' Work Engagement and Withdrawal Intentions: A Structural Equation Modeling Approach. *International Journal of Environmental Research and Public Health, 17,* Article No. 2170. https://doi.org/10.3390/ijerph17072170

Mittal, R., & Elias, S. (2016). Social Power and Leadership in Cross-Cultural Context. *The Journal of Management Development, 35,* 58-74. https://doi.org/10.1108/JMD-02-2014-0020

Nordin, N. A., Rashid, Y. K., Panatik, S. A., & Rashid, A. H. (2019). Relationship between Psychological Capital and Work Engagement. *Journal of Research in Psychology, 1,* 6-12. https://doi.org/10.31580/jrp.v1i4.1115

Park, K. O. (2019). The Relationship between Power Type, Work Engagement, and Organizational Citizenship Behaviors. *International Journal of Environmental Research and Public Health, 16,* 1015-1027. https://doi.org/10.3390/ijerph16061015

Parker, S., & Griffin, M. (2011). Understanding Active Psychological States: Embedding Engagement in a Wider Nomological Net and Closer Attention to Performance. *European Journal of Work and Organizational Psychology, 20,* 60-67. https://doi.org/10.1080/1359432X.2010.532869

Porter, M., & Wang, J. (2022). Personal Resources and Work Engagement: A Literature Review. *The Journal of Continuing Education in Nursing, 53,* 115-121. https://doi.org/10.3928/00220124-20220210-06

Radic, A., Arjona-Fuentes, J. M., Ariza-Montes, A., Han, H., & Law, R. (2020). Job De-

mands-Job Resources (JD-R) Model, Work Engagement, and Well-Being of Cruise Ship Employees. *International Journal of Hospitality Management*, *88,* Article ID: 102518. https://doi.org/10.1016/j.ijhm.2020.102518

Schaufeli, W. B., & Bakker, A. B. (2003). *UWES—Utrecht Work Engagement Scale Preliminary Manual*. Ultrecht University. https://doi.org/10.1037/t76451-000

Schaufeli, W. B., & Bakker, A. B. (2022). Work Engagement: A Critical Assessment of the Concept and Its Measurements. In W. Ruch, A. Bakker, L. Tay, & F. Gander (Eds.), *Handbook of Positive Psychology Assessment* (pp. 273-295). Hogrefe.

Schaufeli, W. B., & Taris, T. W. (2014). A Critical Review of the Job Demands-Resources Model: Implications for Improving Work and Health. In G. J. Bauer, & O. Hämming (Eds.), *Bridging Occupational, Organizational, and Public Health: A Transdisciplinary Approach* (pp. 43-68). Springer. https://doi.org/10.1007/978-94-007-5640-3_4

Schaufeli, W. B., Bakker, A. B., van der Heijden, F. M. M. A., & Prins, J. T. (2009). Workaholism, Burnout and Well-Being among Junior Doctors: The Mediating Role of Role Conflict. *Work & Stress, 23,* 155-172. https://doi.org/10.1080/02678370902834021

Seppälä, P., Mauno, S., Feldt, T., Hakanen, J., Kinnunen, U., Tolvanen, A., & Schaufeli, W. (2009). The Construct Validity of the Utrecht Work Engagement Scale: Multisample and Longitudinal Evidence. *Journal of Happiness Studies: An Interdisciplinary Forum on Subjective Well-Being, 10,* 459-481. https://doi.org/10.1007/s10902-008-9100-y

Seppälä, P., Mauno, S., Kinnunen, M., Feldt, T., Juuti, T., Tolvanen, A., & Rusko, H. (2012). Is Work Engagement Related to Healthy Cardiac Autonomic Activity? Evidence from a Field Study among Finnish Women Workers. *Journal of Positive Psychology, 7,* 95-106. https://doi.org/10.1080/17439760.2011.637342

Simbula, S., Guglielmi, D., & Schaufeli, W. B. (2011). A Three Wave Study on Job Resources, Self-Efficacy and Work Engagement among Italian Schoolteachers. *European Journal of Work and Organizational Psychology, 20,* 285-305. https://doi.org/10.1080/13594320903513916

Siqueira, M. M. M., & Martins, M. C. F. (2010). *Escala de resiliência no trabalho*. (Relatório de pesquisa). Universidade Metodista de São Paulo, São Bernardo do Campo.

Tadić-Vujčić, M. (2019). Personal Resources and Work Engagement: A Two-Wave Study on the Role of Job Resources Crafting among Nurses. *Drustvena Istrazivanja, 28,* 5-44. https://doi.org/10.5559/di.28.1.01

Tafvelin, S., Keisu, B.-I., & Kvistb, E. (2020). The Prevalence and Consequences of Intragroup Conflicts for Employee Well-Being in Women-Dominated Work. *Human Service Organizations: Management, Leadership & Governance, 44,* 47-62. https://doi.org/10.1080/23303131.2019.1661321

Vermooten, N., Malan, J., Kidd, M., & Boonazier, B. (2021). Relational Dynamics amongst Personal Resources: Consequences for Employee Engagement. *SA Journal of Human Resource Management*, *19,* a1310. https://doi.org/10.4102/sajhrm.v19i0.1310

Xanthopoulou, D., Bakker, A. B., Demerouti, E., & Schaufeli, W. (2007). The Role of Personal Resources in the Job Demands-Resources Model. *International Journal of Stress Management, 14,* 121-141. https://doi.org/10.1037/1072-5245.14.2.121