






The demand-control-social support as a moderator variable between job characteristics and engagement

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Abstract. Background: The objective of the present study is to analyze if the variables of the Demand-Control-Social Support model moderate between the characteristics of the job position (JDS) and Engagement. Method: The multi-occupational sample of 302 Spanish employees (64.9% men, 35.1% women) was obtained through non-probabilistic sampling and the data collected were processed with the SPSS 27.0 program.

Results: Statistically significant correlations were found between the JDS and Engagement factors, as well as between Demands, Control and Social Support and Engagement. Finally, the empirical evidence indicates that Demands, Control and Social Support have a moderating role between some dimensions of the job and the Engagement shown, in the sense that Demands, Control and Social Support (understood as a quantitative variable) affect the intensity of the relationship between the characteristics of the job (predictor variable) and engagement (criterion variable). Conclusions: The best moderators are Demand and Social Support, since they moderate the relationship between various factors of the JDS and the Engagement. This is important because, if workers can improve these characteristics, they will show a higher level of Engagement in their jobs.

Keywords: *Job characteristics; personality; engagement; demand, control and social support model; predictive factors.*

EL MODELO «DEMANDA-CONTROL-APOYO SOCIAL» COMO VARIABLE MODERADORA ENTRE LAS CARACTERÍSTICAS DEL PUESTO DE TRABAJO Y EL COMPROMISO LABORAL

Resumen. *Introducción: El objetivo del presente estudio es analizar si las variables del modelo Demanda-Control-Apoyo Social moderan la relación entre las características del puesto de trabajo (JDS) y el Engagement. Método: La muestra multiocupacional de 302 trabajadores españoles (64,9% hombres, 35,1% mujeres) se obtuvo mediante muestreo no probabilístico y los datos recogidos fueron procesados con el programa SPSS 27.0. Resultados: Se encontraron correlaciones estadísticamente significativas entre los factores del JDS y el Engagement, así como entre las Demandas, el Control y el Apoyo Social y el Engagement. La evidencia empírica indica que las Demandas, el Control y el Apoyo Social desempeñan un papel moderador entre algunas dimensiones del puesto de trabajo y el Engagement mostrado, en el sentido de que las Demandas, el Control y el Apoyo Social (entendidos como variable cuantitativa) afectan a la intensidad de la relación entre las características del puesto de trabajo (variable predictora) y el engagement (variable criterio). Conclusiones: Los mejores moderadores son la Demanda y el Apoyo Social, ya que moderan la relación entre diversos factores del JDS y el Engagement. Esto es importante porque, si los trabajadores pueden mejorar estas características, mostrarán un mayor nivel de Engagement en su trabajo.*

Palabras clave: *Características del puesto de trabajo; personalidad; engagement; modelo demanda-control-apoyo social; factores predictores.*

1. Introduction

Studies on the relationships between job characteristics and engagement have found that task identity and work autonomy have a positive effect on work engagement. However, meaning and feedback did not have any significant effect (Sun & Teng, 2013). Sun & Teng point out that the variety of skills, the identity of the task and the importance of the task have a greater direct effect, and work autonomy and feedback have a greater moderating effect. On the other hand, Santos et al. (2016) consider that relational work characteristics contribute to engagement, which in turn contributes to organizational commitment. Albrecht et al. (2018) found that engagement was positively associated with labor resources and employee participation. As far as the Demand-Control-Social Support model is concerned, greater psychological demands and freedom of decision can improve engagement in Japanese employees (Inoue et al., 2013). In this regard, De Cooman et al. (2013) indicate that labor demands frustrate the fulfillment of psychological needs and labor resources promote it.

The analysis of the workplace is one of the fundamental building blocks upon which the structure of companies and organisations is constructed (Mintzberg, 1989). The job is the basis on which human resources are planned and managed (for example, salaries are set and personnel selected) (Fortea et al., 1994). The present study focuses on Hackman and Oldham's Job Diagnostic Survey model (JDS; 1974, 1975). This model considers that five job characteristics (variety of skills, identity of the tasks, importance of the tasks, autonomy and feedback) affect three critical psychological states, which in turn affect the actual results obtained at work (intrinsic motivation, the need for personal growth, quality of work done, turnover and absenteeism). Three more factors (knowledge / skills / abilities, intensity of the need for self-realization and satisfaction with context factors) moderate the relations between the basic dimensions of the job, the critical psychological states and the results of the work. It has also been found that critical psychological states significantly moderate the relationship between personal results and work commitment (Patrick & Bhat, 2014).

Critical psychological states are interpreted using Vroom's Expectancy Theory of Motivation (Vroom, 1964) and they show what workers must experience to achieve intrinsic motivation: (1) They must know the results of their work. (2) They must feel responsible for the results of their work. (3) They should perceive their work as meaningful, feel that it is valuable and important. When these psychological states are present, workers will experience a feeling of well-being after doing a good job, which will impel them to continue doing well in the future.

When one of the three states is not present, the motivation will be reduced proportionally (Fortea et al., 1994, 1995).

The basic idea of the Demand-Control model is that the demand of the job is the result of combining two dimensions of the work: a) the quantity and type of work, and b) control over the tasks performed in the framework of the division of labor. The scale that measures control in the workplace consists of two subscales: discretionary ability and freedom of decision. According to Karasek's original hypothesis (Karasek, 1979, 1992; Karasek & Theorell, 1990), a large number of jobs involve high mental effort and little control over tasks and their results. The lower the work position, the more frequently this critical combination is found for example, assembly-line jobs and some low-skill jobs related to clients). The lack of control over work process and content involves two psychological experiences: little decision latitude and personal autonomy, and little use of personal ability (Demerouti et al., 2001). Thus, high-demand jobs with limited decision latitude generate a significant level of physiological stress. In this respect, there is evidence to suggest that the two components (Karasek & Theorell, 1990; Landsbergis et al., 2000), and particularly low control (Siegrist et al., 2004; Siegrist & Marmot, 2004), have combined and separate effects. On the other hand, work with a profile of high psychological demands and high decision latitude or high level of control over the tasks evoked feelings of professionalism or self-efficacy, which makes it very likely that active work will stimulate healthy functioning and cushion the adverse effects of work stress (Karasek & Theorell, 1990). This two-dimensional conception was subsequently extended to include a third dimension: Social Support in the workplace. The absence of social support intensifies stress (Llorens et al., 2006). This model also shows a moderate association between Engagement and labor exhaustion (Corso-de-Zúñiga et al., 2017) and a significant association between Job Demands and Engagement (Brough & Biggs, 2015). In addition, perceptions of high Job Demands and low Social Support are associated with higher or increasing levels of depressive symptoms over time (Åhlin et al., 2018).

Engagement is defined as a positive, satisfactory relationship with work characterized by Vigor, Dedication and Absorption (Salanova & Schaufeli, 2009; Schaufeli et al., 2006). Workers have a feeling of meaning, enthusiasm, inspiration, pride, dedication and defiance. They are happy in their work. Committed employees can influence the things that affect their lives. Engagement is a positive antecedent of work performance. Llorens et al. (2006) consider that the relationship between engagement, positive affect and emotions at work, produces greater attention and a greater capacity to develop resources. So, people and employees with high engagement are more able to build social networks, are more open

to new opportunities and have more personal resources than people with low engagement. Second, job engagement predicts good health (Bakker & Leiter, 2010) and, in turn, good mental and physical health predicts employee performance (Demerouti & Bakker, 2006). However, other authors have not found any relationship between Job Demands and Engagement (Huo & Boxall, 2017).

The objective of this study is to investigate the moderating role of Job Demands, Job Control and the Social Support between the characteristics of the job and Engagement, and determine if Job Demands, Job Control and Social Support in the workplace affect the intensity of the relationship between Job Characteristics (predictor variable) and Engagement (criterion variable). Our review of the literature had revealed a gap in this line of research. The hypotheses of the study are the following:

Hypothesis 1: The Demand-Control-Social Support (JCQ) will play a moderating role between Job Characteristics (JDS) and Vigor (Engagement), and the relationship between JDS and Vigor will increase.

Hypothesis 2: The Demand-Control-Social Support (JCQ) will play a moderating role between Job Characteristics (JDS) and Dedication (Engagement), and the relationship between JDS and Dedication will increase.

Hypothesis 3: The Demand-Control-Social Support Model (JCQ) will play a moderating role between Job Characteristics (JDS) and Absorption (Engagement), and the relationship between JDS and Absorption will increase.

2. Method

2.1 Participants

The participants were 302 Spanish workers (64.9% male, 35.1% female) from different work contexts. The mean age was 40.61 (SD = 11.03). Civil status distribution was: married or cohabiting (61.3%), single (31.5%), divorced/separated/widowed (7.2%). The distribution of education level was as follows: primary education certificate or less (3.2%), lower secondary education or professional training I (17.6%), upper secondary education, professional training II or university entrance exams for mature students (32.2%), university qualification (47%).

2.2 Instruments

The Job Diagnostic Survey (JDS-21; Hackman & Oldham, 1974, 1975), in the Spanish language version (González, 1997), evaluates the characteristics that influence the results of work. It consists of 21 items and 7 subscales and

the response format is a 7-point Likert scale (From 1- *Very little* to 7- *A lot*). “Factor 1. Skill variety” (3 items, $\alpha=.78$; example, “5. - El trabajo es bastante sencillo y repetitivo [The work is quite simple and repetitive]”), “Factor 2. Task identity” (3 items, $\alpha=.78$; example, “11. - El trabajo me proporciona la posibilidad de finalizar por completo las tareas que emprendo [The work allows me to completely finish the tasks I undertake]”), “Factor 3. Significance” (3 items, $\alpha=.71$; example, “8. -Muchas personas pueden verse afectadas por la calidad y el nivel con que desempeño el trabajo [Many people can be affected by the quality and level of my work]”), “Factor 4. -Autonomy” (3 items, $\alpha=.73$; example, “13. -En este trabajo poseo bastante independencia y libertad para decidir cómo hacerlo [I have enough independence and freedom to decide how to do my job]”), “Factor 5. Feedback” (3 items, $\alpha=.70$; example, “4. -El simple hecho de desempeñar mi trabajo me permite saber cómo lo estoy haciendo [The simple fact of carrying out my work shows me how I am doing]”), “Factor 6. - Feedback from agents” (3 items, $\alpha=.70$; example, “10. -Mis superiores me hacen saber a menudo qué piensan sobre mi rendimiento en el trabajo [My superiors often let me know what they think about my performance at work]”) and “Factor 7. - Dealing with others in their jobs” (3 items, $\alpha=.72$; example, “2. -El trabajo requiere mucha cooperación con otras personas [The work requires a lot of cooperation with other people]”).

The Job Content Questionnaire (JCQ-25; Karasek & Theorell, 1990) describes and analyzes work situations in which stressors are chronic, and pays special attention to the psychosocial characteristics of the work environment. In its Spanish version by Escribà-Agüir et al. (2001) there are 28 items and 3 subscales and the response format is a four-point Likert scale (0. *Strongly disagree* to 3. *Strongly agree*). “Factor 1. - Job Demands” (9 items, $\alpha=.74$; example, “K19. - Mi trabajo requiere trabajar muy duro [My work requires a lot of hard work]” assesses the amount of work, the intellectual demands and the pressure of working time); “Factor 2. -Job Control” (9 items, $\alpha=.74$; example, “K4. - Mi trabajo me permite tomar muchas decisiones por mí mismo [My work allows me to make many decisions for myself]”, assesses the possibility of making decisions creatively and applying and developing one's own abilities); “Factor 3. - Support” (11 items, $\alpha=.87$; example, “K41. - Las personas con las que trabajo se interesan por mí [The people I work with are interested in me]”, assesses the support received by colleagues and superiors).

The Utrecht Work Engagement Scale (UWES; Schaufeli et al., 2002), the Spanish version of which is by Salanova et al. (2000). This three-factor scale consists of 15 items, “Factor 1. - Vigor”, (5 items, $\alpha=.80$; example, “1. - En mi trabajo me siento lleno de energía [In my work I feel full of energy]”).

“Factor 2. - Dedication”, (5 items, $\alpha=.92$; example, “5. - Mi trabajo me inspira [My work inspires me]”). “Factor 3. - Absorption”, (5 items, $\alpha=.75$; example, “8. - Me dejo llevar por mi trabajo [I get carried away by my work]”, with a 7-point Likert-type response format: from 1 = In total disagreement to 7 = Strongly agree).

2.3 Procedure

The sample was obtained by non-probabilistic sampling (Hernández et al., 2004), also called accidental-random sampling (Kerlinger & Lee, 2004). The data were collected by making telephone contact with the directors of several companies and agreeing on the best time to meet with their employees. The response rate was 82%. Participation was voluntary and unpaid. The volunteers were assured of data confidentiality and anonymity. Given this reliance on voluntary participation a wholly random sampling method was not possible. The study was conducted in accordance with the Declaration of Helsinki.

2.4 Data analysis

To begin, the Kolmogorov–Smirnov test was applied to assess the normality of the data, which indicated a good fit. Additionally, the diagrams for all the regressions were analysed, and no issues related to homoscedasticity or excessive residuals were observed. The data analyses were carried out using the statistical package SPSS 27.0. Reliability was obtained using the Cronbach's alpha, while the relationship between job characteristics, the Demand-Control-Social Support model and Engagement was analysed with the Pearson correlation coefficient. A series of multiple hierarchical regression analyses was carried out in steps to examine how the Demand, Control and Social Support (Z) was moderated by the relationship between the characteristics of the job (X) and engagement (Y) (Cohen et al., 2003). To calculate this interaction, the independent measures (X, Z) were focused on the average to reduce the problems of multicollinearity (Kleinbaum et al., 1988), and then the interaction (XZ) was calculated. The main predictor variables were focused on the first step and the interaction term in the second. To establish the importance of the interaction effect, according to Cohen (1992), an increase in explained variance (ΔR^2) of .02 indicates a good effect size. To interpret the results, a simple effects analysis (simple slope of simple regression equations, Aiken and West, 1991) was used to test the hypothesis that a simple slope differs from zero. Three values were selected: Tertile 1 (β_H),

Tertile 2 (βM), and Tertile 3 (βL) of the Demand-Control-Social Support Model.

3. Results

3.1 Reliability analysis

All the instruments used showed adequate indices of internal consistency, evaluated using the Cronbach alpha coefficient (Table 1). The minimum value was .71 (JDS. F-Feedback from agents and JDS. G-Dealing with others in their jobs), while the maximum value of internal consistency was .90 for Dedication (Engagement).

3.2 Correlation analyses

The results of the correlation analysis are shown in Table 2. The most important results are: (1) Dedication, Job Support, Job Control and JDS. A-Variety positively correlated with all study variables; (2) Positive correlations were obtained between Vigor and the other variables included in this research, with the exception of JDS. E-Feedback; (3) Absorption positively correlated with all variables except for JDS. E-Feedback; (4) Job Demand positively correlated with all variables except for JDS. B-Identity and JDS. D- Autonomy; (5) JDS. B-Identity

Table 1. Descriptive statistics and reliability values with Cronbach’s alpha coefficient

| Variable | Minimum | Maximum | Mean | SD | alpha |
|---------------------|---------|---------|-------|------|-------|
| ENG-Vigor | 8 | 35 | 23.88 | 5.15 | .81 |
| ENG-Dedication | 5 | 35 | 23.44 | 6.15 | .90 |
| ENG-Absorption | 7 | 35 | 22.93 | 5.91 | .77 |
| JCQ-Social Support | 17 | 37 | 27.89 | 3.95 | .73 |
| JCQ-Job Demand | 10 | 33 | 21.67 | 3.01 | .74 |
| JCQ-Job Control | 6 | 24 | 16.95 | 3.15 | .83 |
| JDS. A-Variety | 3 | 21 | 13.48 | 3.84 | .72 |
| JDS. B-Identity | 4 | 21 | 13.49 | 3.67 | .77 |
| JDS. C-Significance | 5 | 21 | 14.79 | 3.32 | .73 |
| JDS. D-Autonomy | 3 | 20 | 13.32 | 3.53 | .74 |
| JDS. E-Feedback | 7 | 21 | 13.38 | 2.27 | .72 |
| JDS. F-Agents | 3 | 21 | 12.21 | 3.75 | .71 |
| JDS. G-Dealing | 3 | 21 | 15.61 | 3.27 | .71 |

Table 2. Correlation between the Demand-Control-Social Support model (JCQ), Job characteristics (JDS) and Engagement

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|--------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----|
| ENG-Vigor | | | | | | | | | | | | | |
| ENG-Dedication | .767** | | | | | | | | | | | | |
| ENG-Absorption | .817* | .823** | | | | | | | | | | | |
| JCQ-Social Support | .282** | .345** | .302** | | | | | | | | | | |
| JCQ-Job Demand | .224* | .338** | .286** | .206** | | | | | | | | | |
| JCQ-Job Control | .411** | .571** | .495** | .420** | .363** | | | | | | | | |
| JDS-A-Variety | .535* | .613** | .573** | .329** | .317** | .548** | | | | | | | |
| JDS-B-Identity | .260** | .306** | .221** | .246** | .099 | .173** | .217** | | | | | | |
| JDS-C-Significance | .181* | .225** | .240** | .224** | .169** | .259** | .306** | .089 | | | | | |
| JDS-D-Autonomy | .295** | .399** | .366** | .361** | .102 | .528** | .436** | .345** | .228** | | | | |
| JDS-E-Feedback | .107 | .179** | .105 | .262** | .167** | .252** | .215** | .119* | .190** | .110 | | | |
| JDS-F-Agents | .195** | .307** | .227** | .264** | .171** | .160** | .277** | .105 | .169** | .174** | .168** | | |
| JDS-G-Dealing | .249* | .310** | .309** | .267** | .183** | .293** | .369** | -.038 | .277** | .269** | .116* | .214** | |

** $p < .01$; * $p < .05$

correlated positively with all variables except Job Demand, JDS. C-Significance, JDS. F-Agents and JDS. G-Dealing; (6) JDS. C-Significance correlated positively with all variables except JDS. B-Identity; (7) JDS. D-Autonomy correlated positively with all variables except Job Demand and JDS. E-Feedback; (8) JDS. E-Feedback correlated positively with all variables except Vigor, Absorption and JDS. D-Autonomy; (9) JDS. F-Agents correlated positively with all variables except for JDS. B-Identity, and (10) JDS. G-Dealing correlates positively with all variables except JDS. B-Identity.

3.3 Analysis of the moderator effect

Hypothesis 1 concerns the moderating role of the Demand, Control and Social Support (JCQ) model between the characteristics of the job (JDS) and Vigor (Engagement). The results on the moderating effect of Social Support (JCQ) are confirmed for JDS. B-Identity ($\beta_{xz} = -.197, \Delta R^2 = .039, p < .001$), JDS. C-Significance ($\beta_{xz} = -.201, \Delta R^2 = .040, p < .001$), and JDS. G-Dealing ($\beta_{xz} = -.157, \Delta R^2 = .024, p < .01$). The negative symbol in the interaction coefficients (β_{xz}) indicates that the intensity of the relationship decreases as the level of Social Support increases. The simple effects analysis shows that the slopes are statistically different from zero in low Social Support values (β_L) and means (β_M), but not in high values (β_H), in the three dimensions: JDS. B-Identity ($\beta_L = .477, \beta_M = .162, \beta_H = -.001$), JDS. C-Significance ($\beta_L = .335, \beta_M = .026, \beta_H = .027$) and JDS. G-Dealing ($\beta_L = .233, \beta_M = .322, \beta_H = .042$). Therefore, there is a relationship between these characteristics of the job and Vigor when the workers have a low level of Social Support. However, the relationship disappears when the level of Social Support is medium and high in the dimensions JDS. B-Identity and JDS. C-Significance, and high in the JDS. G-Dealing dimension.

The results on the moderating effect of Job Demand (JCQ) are confirmed for JDS. A-Variety ($\beta_{xz} = -.181, \Delta R^2 = .030, p < .001$). The simple effects analysis shows that the slopes are statistically different from zero in Job Demand values in the dimension of JDS. A-Variety ($\beta_L = .600, \beta_M = .496, \beta_H = .378$). Therefore, there is a relationship between this characteristic of the job and Vigor in the three values of Job Demand of the workers. The results on the moderating effect of Job Control (JCQ) are not confirmed (Table 3).

Hypothesis 2 concerns the moderating role of the Demand, Control and Social Support (JCQ) model between the characteristics of the job (JDS) and Dedication (Engagement). The results on the moderating effect of the Social Support (JCQ) are confirmed for JDS. B-Identity ($\beta_{xz} = -.193, \Delta R^2 = .037, p < .001$), JDS. C-Significance ($\beta_{xz} = -.139, \Delta R^2 = .020, p < .01$), JDS. G-Dealing ($\beta_{xz} = -.125, \Delta R^2 = .020$,

Table 3. Analysis of the moderator effect of the Demand-Control-Social Support Model (JCQ) between Jobs Characteristics (JDS) and Vigor (Engagement)

| | Hierarchical multiple regression | | | | | Simple effects | | |
|---------------------------|----------------------------------|-----------|---------|--------------|--------------|----------------|-----------|-----------|
| | Step 1 | | Step 2 | | | β_L | β_M | β_H |
| | β_x | β_z | R^2 | β_{xz} | ΔR^2 | | | |
| <i>JCQ-SOCIAL SUPPORT</i> | | | | | | | | |
| JDS. A-Variety | .494*** | .123* | .294*** | -.387 | .000 | .558*** | .306** | .594*** |
| JDS. B-Identity | .200*** | .236*** | .114*** | -.197*** | .039*** | .477*** | .162 | -.001 |
| JDS. C-Significance | .128* | .257*** | .090*** | -.201*** | .040*** | .335*** | .026 | .027 |
| JDS. D-Autonomy | .224*** | .202*** | .117** | -.086 | .007 | .311** | .235** | .195 |
| JDS. E-Feedback | .030 | .274*** | .074*** | -.056 | .003 | .117 | .015 | .052 |
| JDS. F-Agents | .089*** | .250*** | .126* | -.057 | .003 | .117 | .070 | .208* |
| JDS. G-Dealing | .183** | .233*** | .105*** | -.157** | .024** | .233* | .322*** | .042 |
| <i>JCQ-JOBDEMAND</i> | | | | | | | | |
| JDS. A-Variety | .513*** | .062 | .282*** | -.181*** | .030*** | .600*** | .496*** | .378*** |
| JDS. B-Identity | .235*** | .202*** | .100*** | -.089 | .007 | .242** | .304*** | .080 |
| JDS. C-Significance | .144* | .199** | .064*** | -.040 | .001 | .273** | .044 | .182 |
| JDS. D-Autonomy | .272*** | .196*** | .117*** | -.134* | .016* | .304*** | .344*** | .134 |
| JDS. E-Feedback | .068 | .207*** | .045*** | -.078 | .006 | .083 | .109 | .017 |
| JDS. F-Agents | .199*** | .179** | .078*** | -.012 | .000 | .132 | .240** | .191 |
| JDS. G-Dealing | .179** | .199*** | .078*** | -.012 | .047 | .241* | .163 | .214 |
| <i>JCQ-JOBCONTROL</i> | | | | | | | | |
| JDS. A-Variety | .445*** | .160** | .299*** | -.114** | .012* | .510*** | .543*** | .326*** |
| JDS. B-Identity | .197*** | .385*** | .206*** | .069 | .005 | .030 | .405*** | .277** |
| JDS. C-Significance | .075 | .393*** | .170*** | -.067 | .004 | .190 | .387*** | .075 |
| JDS. D-Autonomy | .099 | .359*** | .170*** | -.004 | .000 | .035 | .363*** | .196* |
| JDS. E-Feedback | .002 | .410*** | .163 | -.052 | .003 | .042 | .036 | .029 |
| JDS. F-Agents | .142** | .391*** | .184*** | .023 | .001 | .019 | .377** | .214** |
| JDS. G-Dealing | .141** | .370*** | .181*** | -.018 | .000 | .278** | .103 | .164 |

*** $p < .001$; ** $p < .01$; * $p < .05$

Note: $\beta_x = JDS$; $\beta_z = JCQ$; $\beta_{xz} =$ Interaction between JDS and JCQ; $R^2 =$ variance explained by JDS and JCQ; $\Delta R^2 =$ increment in variance explained by the interaction; $\beta_L =$ Tertile 1; $\beta_M =$ Tertile 2; $\beta_H =$ Tertile 3.

$p < .01$). The negative symbol in the interaction coefficients (β_{xz}) indicates that the intensity of the relationship decreases as the level of Social Support increases. The simple effects analysis shows that slopes are statistically different from zero in low Social Support values (β_L), in the three dimensions: JDS. B-Identity ($\beta_L = .536$, $\beta_M = .017$, $\beta_H = .088$), JDS. C-Significance ($\beta_L = .307$, $\beta_M = .204$, $\beta_H = .014$) and JDS. G-Dealing ($\beta_L = .423$, $\beta_M = .015$, $\beta_H = .116$). Therefore, there is a relationship between these characteristics of the job and dedication when workers have a low level of Social Support. However, the relationship disappears when the level of Support is medium and high in the dimensions JDS. B-Identity and JDS. G-Dealing, and high in the JDS. C-Significance dimension.

The results on the moderating effect of Job Demand (JCQ) are confirmed for JDS. A-Variety ($\beta_{xz} = -.167$, $\Delta R^2 = .026$, $p < .001$) and JDS. D-Autonomy ($\beta_{xz} = -.177$, $\Delta R^2 = .028$, $p < .001$). The simple effects analysis shows that the slopes are statistically different from zero in Job Demand values in the JDS. A-Variety dimension ($\beta_L = .702$, $\beta_M = .513$, $\beta_H = .489$) and JDS. D-Autonomy ($\beta_L = .448$, $\beta_M = .463$, $\beta_H = .152$). Therefore, there is a relationship between these characteristics of the job and the dedication in the three values of JDS. A-Variety of the workers and in the low and medium values of JDS. D-Autonomy.

The results on the moderating effect of Job Control (JCQ) are confirmed for JDS. A-Variety ($\beta_{xz} = -.165$, $\Delta R^2 = .026$, $p < .001$). The simple effects analysis shows that the slopes are statistically different from zero in Job Demand values in the JDS. A-Variety dimension ($\beta_L = .640$, $\beta_M = .618$, $\beta_H = .305$). Therefore, there is a relation between this characteristic of the job and the dedication in the three values of JDS. A-Variety of the workers (Table 4).

Hypothesis 3 concerns the moderating role of the Demand, Control and Social Support (JCQ) model between Job characteristics (JDS) and Absorption (Engagement). The results on the moderating effect of the Social Support (JCQ) are confirmed for JDS. B-Identity ($\beta_{xz} = -.206$, $\Delta R^2 = .042$, $p < .001$), JDS. C-Significance ($\beta_{xz} = -.024$, $\Delta R^2 = .023$, $p < .01$). The negative symbol in the interaction coefficients (β_{xz}) indicates that the intensity of the relationship decreases as the level of Social Support increases. The simple effects analysis shows that the slopes are statistically different from zero in low (β_L) and medium (β_M) Social Support values, but not in high values (β_H), in the two dimensions: JDS. B-Identity ($\beta_L = .476$, $\beta_M = .077$, $\beta_H = .073$) and JDS. C-Significance ($\beta_L = .308$, $\beta_M = .263$, $\beta_H = .035$). Therefore, there is a relationship between these Job characteristics and Vigor when the workers have a low level of Social Support. However, the relationship disappears when the level of Social Support is medium and high in the JDS. B-Identity, and high in the JDS. C-Significance dimension.

Table 4. Analysis of the moderator effect of the Demand-Control-Social Support Model (JCQ) between Job Characteristics (JDS) and Dedication (Engagement)

| | Hierarchical multiple regression | | | | | Simple effects | | |
|---------------------------|----------------------------------|-----------------|----------------|-----------------|---------|----------------|----------------|----------------|
| | Step 1 | | R ² | Step 2 | | β _L | β _M | β _H |
| β _x | β _z | β _{xz} | | ΔR ² | | | | |
| <i>JCQ-SOCIAL SUPPORT</i> | | | | | | | | |
| JDS. A-Variety | .559*** | .162*** | .393*** | .005 | .000 | .551*** | .500*** | .680*** |
| JDS. B-Identity | .236*** | .289*** | .167*** | -.193*** | .037*** | .536*** | .017 | .088 |
| JDS. C-Significance | .231*** | .284*** | .163*** | -.139** | .020** | .307** | 204* | .014 |
| JDS. D-Autonomy | .200*** | .231*** | .201*** | -.062 | .004 | .378*** | .342*** | .307** |
| JDS. E-Feedback | .092 | .322*** | .122*** | -.043 | .002 | .226* | .051 | .083 |
| JDS. F-Agents | .233*** | .285*** | .165*** | -.066 | .004 | .322*** | .347*** | .028 |
| JDS. G-Dealing | .223*** | .294*** | .151*** | -.125** | .020** | .423*** | .015 | .116 |
| <i>JCQ-JOBDEMAND</i> | | | | | | | | |
| JDS. A-Variety | .560*** | .160*** | .392*** | -.167*** | .026*** | .702*** | .513*** | .489*** |
| JDS. B-Identity | .272*** | .312*** | .183*** | -.117* | .012* | .261** | .351*** | .110 |
| JDS. C-Significance | .025 | .315*** | .140*** | .169** | .001 | .252** | .023 | .290** |
| JDS. D-Autonomy | .366*** | .300*** | .241*** | -.177*** | .028*** | .448*** | .463*** | .152 |
| JDS. E-Feedback | .123* | .309*** | .118*** | -.089 | .008 | .101 | .252* | .090 |
| JDS. F-Agents | .276*** | .295*** | .186*** | -.090 | .008 | .276** | .224* | .332** |
| JDS. G-Dealing | .252*** | .292*** | .170*** | -.017 | .000 | .102 | .012 | .110 |
| <i>JCQ-JOBCONTROL</i> | | | | | | | | |
| JDS. A-Variety | .429*** | .336*** | .451*** | -.165*** | .026*** | .640*** | .618*** | .305*** |
| JDS. B-Identity | .213*** | .537*** | .369*** | .092* | .008* | .051 | .386 | .369*** |
| JDS. C-Significance | .079 | .554*** | .331*** | .020 | .000 | .009 | .502*** | .094 |
| JDS. D-Autonomy | .130** | .502*** | .333*** | .029 | .001 | .127 | .397*** | .249** |
| JDS. E-Feedback | .033 | .565*** | .325*** | -.022 | .000 | .071 | .171 | .181* |
| JDS. F-Agents | .225*** | .535*** | .372*** | -.063 | .004 | .071 | .171 | .181* |
| JDS. G-Dealing | .155*** | .525*** | .343*** | .044 | .002 | .221** | .106 | .336*** |

*** $p < .001$; ** $p < .01$; * $p < .05$

Note: β_x = JDS; β_z = JCQ; β_{xz} = Interaction between JDS and JCQ; R² = variance explained by JDS and JCQ; ΔR² = increment in variance explained by the interaction; β_L = Tertile 1; β_M = Tertile 2; β_H = Tertile 3.

The results on the moderating effect of Job Demand (JCQ) are confirmed in the case of JDS. A-Variety (β_{xz} = -.170, ΔR² = .027, $p < .001$), JDS. B-Identity (β_{xz} = -.151, ΔR² = .020, $p < .01$) and JDS. D-Autonomy (β_{xz} = -.166, ΔR² = .024, $p < .01$). The simple effects analysis shows that the slopes are statistically different

from zero in Job Demand values in the JDS. A-Variety dimension ($\beta_L=.635$, $\beta_M=.491$, $\beta_H=.454$), JDS. B-Identity ($\beta_L=.206$, $\beta_M=.290$, $\beta_H=.073$), JDS. D-Autonomy ($\beta_L=.398$, $\beta_M=.334$, $\beta_H=.256$). Therefore, there is a relationship between these characteristics of the job and absorption when workers have a low and medium level of Job Demand. However, the relationship disappears when the level is high in the JDS. B-Identity dimension. The results on the moderating effect of Job Control (JCQ) are not confirmed (Table 5).

4. Discussion

The main objective of this study was to investigate the possible moderating role of the variables of the Demand-Control-Social Support model (JCQ) between the characteristics of the job (JDS) and Engagement.

The first hypothesis proposed in the investigation refers to the correlations between the dimensions of the JDS and Vigor (engagement). Its objective is to verify if the Demand-Control-Social Support model affects the intensity of the relationship between the characteristics of the job, measured by the JDS (predictive variable) and Vigor (criterion variable). That is, since some dimensions of work affect Engagement, the objective was to determine whether people with high levels of Demand-Control-Social Support tended to show greater Vigor at work. The results confirm that Social Support has a significant moderating effect for three dimensions of the JDS (JDS. B-Identity, JDS. C-Significance and JDS. G-Dealing) and their relation with Vigor. Job Demand has a significant moderating effect for JDS. A-Variety and its relationship with Vigor. Job Control is not shown as a moderating variable in the relationship between the characteristics of the workplace and Vigor.

The second hypothesis refers to the correlations between the dimensions of the JDS and Dedication (engagement). Its objective is to verify if the Demand-Control-Social Support model affects the intensity of the relationship between the characteristics of the job, measured by the JDS (predictive variable), and Dedication (criterion variable). The results confirm that Social Support has a significant moderating effect on three dimensions of the JDS (JDS. B-Identity, JDS. C-Significance and JDS. G-Dealing) and its relation with Dedication. Job Demand has a significant moderating effect on two dimensions of the JDS (JDS. A-Variety and JDS. D-Autonomy) and its relationship with Dedication. Job Control has a significant moderating effect on JDS. A-Variety and its relationship with Dedication.

The third hypothesis refers to the correlations between the dimensions of the JDS and Absorption (engagement). Its objective is to verify if the

Table 5. Analysis of the moderator effect of the Demand-Control-Social Support Model (JCQ) between Job Characteristics (JDS) and Absorption (Engagement)

| | Hierarchical multiple regression | | | | | Simple effects | | |
|---------------------------|----------------------------------|----------------|----------------|-----------------|-----------------|----------------|----------------|----------------|
| | Step 1 | | R ² | Step 2 | | β _L | β _M | β _H |
| | β _x | β _z | | β _{xz} | ΔR ² | | | |
| <i>JCQ-SOCIAL SUPPORT</i> | | | | | | | | |
| JDS. A-Variety | .533*** | .127* | .341*** | .016 | .000 | .492*** | .465*** | .467*** |
| JDS. B-Identity | .157*** | .262*** | .107*** | -.206*** | .042*** | .476*** | .077 | .073 |
| JDS. C-Significance | .182*** | .264*** | .118*** | -.024* | .023** | .308** | .263** | .035 |
| JDS. D-Autonomy | .295*** | .195*** | .161*** | -.084 | .007 | .342*** | .343*** | .279** |
| JDS. E-Feedback | .028 | .295*** | .086*** | .010 | .000 | .040 | .070 | .090 |
| JDS. F-Agents | .158** | .261*** | .109*** | -.070 | .005 | .171 | .111 | .229* |
| JDS. G-Dealing | .248*** | .236*** | .142*** | -.115* | .013* | .271** | .342*** | .126 |
| <i>JCQ-JOBDEMAND</i> | | | | | | | | |
| JDS. A-Variety | .533*** | .118** | .333*** | -.170*** | .027*** | .635*** | .491*** | .454*** |
| JDS. B-Identity | .189*** | .267*** | .111*** | -.151** | .020** | .206* | .290** | .073 |
| JDS. C-Significance | .193*** | .253*** | .113*** | -.914 | .003 | .363*** | .060 | .284* |
| JDS. D-Autonomy | .336*** | .252*** | .188*** | -.166** | .024** | .398*** | .334*** | .256* |
| JDS. E-Feedback | .054 | .274*** | .077*** | -.073 | .005 | .083 | .042 | .080 |
| JDS. F-Agents | .207*** | .255*** | .120*** | -.075 | .005 | .192* | .278** | .147 |
| JDS. G-Dealing | .260*** | .239*** | .142*** | -.052 | .002 | .296** | .235** | .236* |
| <i>JCQ-JOBCONTROL</i> | | | | | | | | |
| JDS. A-Variety | .432*** | .259*** | .371*** | -.124** | .015** | .588*** | .452*** | .409*** |
| JDS. B-Identity | .139** | .470*** | .258*** | .066 | .004 | .028 | .312 | .253** |
| JDS. C-Significance | .117** | .267*** | .255*** | .013 | .000 | .082 | .417*** | .144 |
| JDS. D-Autonomy | .137** | .422*** | .253*** | -.026 | .001 | .165 | .398*** | .196* |
| JDS. E-Feedback | -.026 | .503*** | .242*** | -.007 | .000 | .055 | .103 | .113 |
| JDS. F-Agents | .156** | .470*** | .264*** | -.046 | .002 | .133 | .297* | .222** |
| JDS. G-Dealing | .180*** | .442*** | .269*** | -.086 | .000 | .263** | .208 | .274*** |

*** $p < .001$; ** $p < .01$; * $p < .05$

Note: β_x = JDS; β_z = JCQ; β_{xz} = Interaction between JDS and JCQ; R² = variance explained by JDS and JCQ; ΔR² = increment in variance explained by the interaction; β_L = Tertile 1; β_M = Tertile 2; β_H = Tertile 3.

Demand-Control-Social Support model affects the intensity of the relationship between the characteristics of the job, measured by the JDS (predictive variable), and Absorption (criterion variable). The results confirm that Social Support has a significant moderating effect on two dimensions of the JDS (JDS. B-Identity

and JDS. C-Significance) and its relation with Absorption. Job Demand has a significant moderating effect on three dimensions of the JDS (JDS. A-Variety, JDS. B-Identity and JDS. D-Autonomy) and its relationship with Absorption. Job Control is not shown as a moderating variable in the relationship between the characteristics of the workplace and Absorption.

5. Conclusion

Of the three factors of the Demand-Control-Social Support model, the Social Support and Job Demand factors behave best. Social Support plays a moderating role between the dimensions JDS. B-Identity and JDS. C-Significance, and the three dimensions of Engagement, while JDS. G-Dealing is significant in the case of Vigor and Dedication. Job Demand plays a significant moderating role between JDS. A-Variety and the three dimensions of Engagement, between JDS. D-Autonomy and Dedication and Absorption, and between JDS. B-Identity and Absorption. Job Control was only significant in the relationship between JDS. A-Variety and Dedication.

In conclusion, the results of this research show that the Demand-Control-Social Support dimensions that are the best moderators are Job Demand and Social Support, since they moderate the relationship between several factors of the JDS and Engagement. This is important for intervention in the workplace because, if workers are able to improve the characteristics of Demand, Control and Social Support – for example, by becoming more autonomous or making their work more varied or significant – they are likely to show a higher level of engagement in their jobs.

5.1 Limitations and implications

This study is not without limitations. Firstly, the data were obtained through self-reports, which may introduce biases such as social desirability or lack of sincerity (Alzghoul et al., 2018). Future research should consider incorporating evaluations from co-workers and/or supervisors to complement self-reported data (Andreassen et al., 2010). Additionally, the study could be improved by employing structural equation modeling in the data analysis. The multiple regression analysis used to examine the relationship between the predictor and criterion variables only allowed us to draw conclusions about direct and inverse influences among the variables.

The study also offers several practical implications: The findings are particularly valuable for informing Human Resource Management policies, including

selection processes, career development plans, and training programs. Among the moderators examined, Demand and Social Support emerged as the most influential. These variables moderate the relationship between various components of the Job Diagnostic Survey (JDS) and employee engagement. This is significant because improving these characteristics can lead to higher levels of engagement among workers. Social support and job demands are factors to consider when assessing the applicability of the results to companies and organizations. Social support can be enhanced through teamwork and supportive behaviors on the part of managers, such as adequate and non-abusive supervision. Furthermore, social support and optimal managerial supervision can promote high productivity and employee well-being. Regarding job demands, organizations should monitor the level of demands they place on employees in order to maintain their well-being at work. Therefore, it is important for organizations to adjust their workloads to employees' capabilities.

Conflict of interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Data availability

The data that support the findings of this study are available upon reasonable request.

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