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Original

The Work Design Questionnaire: Spanish version and validation

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A B S T R A C T

The purpose of this study is to validate the Spanish version of the Work Design Questionnaire (WDQ; Morgeson & Humphrey, 2006). Employees from three Colombian samples completed the questionnaire ($N=831$). Confirmatory factor analyses revealed a 21-factor structure (χ^2/df ratio = 2.40, SRMR = .06, RMSEA = .04, CFI = .90) with adequate levels of convergent and discriminant validity. Additional support for construct validity was found from significant differences among different occupational groups (professional and nonprofessional, health-focused, commercial, and manufacturing workers). Furthermore, knowledge, social, and work context characteristics showed incremental validity over task characteristics on job satisfaction and perceived performance. Possible interpretations of these relationships are offered. It is concluded that the study provides evidence for the validity of a Spanish version of the scale, and presents further support for the generalization of the 21-factor structure of work design characteristics in different cultural settings.

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Validación española del *Work Design Questionnaire*

R E S U M E N

El propósito de este estudio es validar la versión española del Work Design Questionnaire (WDQ; Morgeson y Humphrey, 2006). Tres muestras de empleados colombianos completaron el cuestionario ($N=831$). El análisis factorial confirmatorio reveló una estructura de 21 factores (razón χ^2/gl = 2.40, SRMR = .06, RMSEA = .04, CFI = .90) con adecuados niveles de validez convergente y discriminante. Se encontraron diferencias significativas entre diferentes grupos ocupacionales (profesionales, no profesionales, trabajadores de la salud, comerciales y de producción). También se encontró que las características del conocimiento, sociales y contextuales aportaron validez incremental sobre la satisfacción laboral y el desempeño percibido. Se ofrecen posibles interpretaciones de estas relaciones. Se concluye que el estudio proporciona evidencia suficiente sobre la validez de la versión española de la escala, lo que presenta más apoyo para la generalización de la estructura del modelo de características del trabajo de 21 factores en diferentes contextos culturales.

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Work Design "describes how jobs, tasks, and roles are structured, enacted, and modified, as well as the impact of these structures, enactments, and modifications on individual, group, and organizational outcomes" (Grant & Parker, 2009, p. 319). From the early studies on task attributes (Turner & Lawrence, 1965) to the interdisciplinary approach to work design (Campion, 1988), it has been a demand, from both scientists and practitioners, to have a valid and reliable instrument assessing work characteristics in organizational settings. During the last 30 years questionnaires such as the *Job Diagnostic Survey* (JDS; Hackman & Oldham, 1975) and the *Multimethod Job Design Questionnaire* (MJDQ; Campion, 1985) have been developed to assess work design characteristics; however, these instruments generally have suffered from two

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drawbacks: (a) questionable psychometric properties related with the low internal consistency of the JDS (Kulik, Oldham, & Langner, 1988; Taber & Taylor, 1990) and problems with the factor structure of the MJDQ (Edwards, Scully, & Brtek, 1999, 2000); and (b) a mismatch between the work characteristics assessed by the instruments and the real characteristics presented in nowadays organizational settings, that is represented in a shift from manufacturing economies to service and knowledge economies that had altered the nature of work in organizations (Grant & Parker, 2009). Due to these limitations, Morgeson and Humphrey (2006) developed the *Work Design Questionnaire* (WDQ), that presents both high reliable psychometrics and takes into account current models of work design (Grant, Fried, & Juillerat, 2010; Humphrey, Nahrgang, & Morgeson, 2007).

This need for a valid and reliable instrument is especially relevant in non-English speaking countries, where work dynamics have changed during the last 20 years and old work design instruments are no longer appropriate for these new organizational settings. Thus, the purpose of the present study is to validate a Spanish version of the WDQ with a sample of Colombian workers.

Work Characteristics Assessment

From the early work of Turner and Lawrence (1965), work characteristics have been assessed mainly through self-report questionnaires that ask workers to rate their personal evaluation of the presence of certain work attributes. Using this approach, two major work design questionnaires have been developed: the Job Design Survey (JDS) and the Multimethod Job Design Questionnaire (MJDQ).

Richard Hackman and his colleagues developed the JDS as an instrument to assess the *job characteristics model* (JCM) (Hackman & Lawler, 1971; Hackman & Oldham, 1975, 1976), which has been the standard model in work design for both academics and practitioners during the last 40 years. The JDS is a self-reporting instrument meant to diagnose the motivational properties of a job prior to a redesign procedure. The major contribution of the JCM and JDS was that it established that core job characteristics are associated with favorable attitudinal and behavioral reactions (Grant et al., 2010). However, the main criticisms to JCM were: (a) the treatment of within-person relations as person-situation relations, (b) the model structure, due to some inconsistences in the role of the moderator and mediators, (c) the small subset of characteristics included in the model, (d) concerns about the convergent and divergent validity of the JDS, and (e) the theoretical and mathematical justification of the composite job characteristics index (Fried & Ferris, 1987; Johns, Xie, & Fang, 1992; Roberts & Glick, 1981).

Taking into account some of these criticisms, a new model of work design emerged: the *interdisciplinary model of job design* (Campion, 1988; Campion & Thayer, 1985) which aimed to develop a new taxonomy of work design that included 48 different job characteristics with a 48-item questionnaire. The major strengths of this approach were: (a) the inclusion of new work characteristics that were relevant to the work context and (b) the discovery that different job design approaches influence different outcomes. On the other side, the major weakness of the interdisciplinary model lay in the psychometric proprieties of the MJDQ, especially the construct validity, since every dimension was assessed by only one item (Edwards et al., 1999).

From these previous models, Frederick Morgeson and Stephen Humphrey developed an inductively generated collection of work design characteristics that integrated the work design literature into four major work characteristics: (a) Task Characteristics, which include work scheduling autonomy, decision-making autonomy, work methods autonomy, task variety, task significance, task identity, and feedback from job; (b) Knowledge Characteristics, which include job complexity, information processing, problem solving, skill variety, and specialization; (c) Social Characteristics, which include social support, initiated interdependence, received interdependence, interaction outside the organization and feedback from others; and (d) Work Context Characteristics, which include ergonomics, physical demands, work conditions, and equipment use (Morgeson & Humphrey, 2006). This taxonomy integrated some elements of previous models but included new characteristics that are present in today's organizations (i.e., knowledge characteristics that reflect the current *knowledge work* and social characteristics that reflect the emphasis on service organizations that rely more deeply on social interactions).

The construction of the WDQ was developed through five stages: (a) review of job characteristics in the literature and grouping of the resulting characteristics into a 21 characteristics proposal, (b) literature review to search items that evaluate each job characteristic, (c) adapting items and creating new items for the 21 characteristics proposal, (d) statistical analyses of the 21 job characteristics proposal using confirmatory factor analysis (CFA), and (e) construct validity analyses using O*NET database and checking relationship between occupations and various outcome measures (Morgeson & Humphrey, 2006). The results of this procedure gave support to a 21-factor structure with a high reliability and convergent and discriminant validity, which in turn resolved two of the major criticisms of previous work design instruments: the limited number of job characteristics considered (JDS) and the weak psychometrics (MJDQ).

Work Design in Spanish Speaking Countries

All preceding models were developed within the North American context, with research on work design in Spanish speaking countries dealing mainly with: (a) the validation of work design instruments in their cultural settings or (b) the use of a work design instrument as a measure within a broader research.

The research on work design in Spanish speaking countries from a validation perspective includes a couple of JDS validations (Dávila & Chacón, 2003; Fuertes, Munduate, & Fortea, 1996; Martínez-Gómez & Marín-García, 2009) which confirmed the 5-factor dimension structure but with some reliability problems, especially in the skill variety, autonomy, and identity dimensions. From the second perspective, the work design research on those countries was particularly associated with the use of JCM. In Spain there had been a number of studies using the JDS, as in a study of burnout, organizational climate, and work motivation (Boada, Vallejo, & Agulló, 2004), in which three out of five JCM dimensions were associated with different burnout outcomes (autonomy, skill variety, task significance). Other research studied the influence of communication skills on work teams management (Ramis, Manassero, Ferrer, & García-Buades, 2007), in which no direct effect of job characteristics was associated with leader communication skills. Finally, a study on the redesign of tasks in the Spanish automotive industry concluded that all JCM dimensions were related with attitudinal outcomes (especially autonomy and feedback), but not with any performance outcomes (Osca & Urien, 2001). In Latin America, research on work design was more limited: two studies, including the JDS, were conducted in Perú, one that sought to explore the utility of the socio-technical systems theory in that country, which reported a significant influence of feedback on the degree of technology implementation (Salas & Glickman, 1990); the other study, by Solf (2006), used a section of JDS (employee growth need strength) to investigate labor intrinsic motivation and personality in a sample of Peruvian workers.

These studies in Spanish speaking countries indicate that there is an interest in the design area, even though the tools available offered a limited range of job characteristics and the psychometric specifications were not the most appropriate nowadays. Taking these problems into account, the purpose of the present research is to bridge this gap by adapting the WDQ to the Spanish language, which will offer researchers and practitioners a valid and reliable instrument to work with Spanish-speaking workers in the area of work design.

Hypotheses Development

In this paper we describe the adaptation process of the WDQ into Spanish. We tested the psychometric properties of the adapted version through a variety of means. First, we conducted a series of CFAs to confirm the factor structure of the Spanish adaptation; second, we further examined the psychometric properties of the scale by testing its capacity to differentiate across occupations; third, we explored the relations of major work characteristics with job satisfaction and perceived performance; finally, we examined the incremental validity of work characteristics for job satisfaction and perceived performance.

In the original article about WDQ, five different factor structure models were tested: (a) a 4-factor model examines the four broad categories of work characteristics (task, knowledge, social, and context); (b) an 18-factor model examines each work characteristic; (c) a 19-factor model separates interdependence into its received and initiated components; (d) a 20-factor model separates autonomy into its three components, which includes autonomy in work scheduling, decision making, and work methods; (e) finally, a 21-factor model separates both interdependence and autonomy into the identified components. Following the results from the original English version (Morgeson & Humphrey, 2006) and the German (Stegmann et al., 2010) and Italian (Zaniboni, Truxillo, & Fraccarolli, 2013) validations of the WDQ, it is expected that the Spanish version of the WDQ will fit into a 21-factor model.

Hypothesis 1.   The Spanish WDQ version represents a 21-factor structure.

In order to validate the WDQ, it is important that the Spanish version could detect differences across occupations according to their job and role contents, because the original WDQ is aimed at differentiating between jobs, and thus, the Spanish version should be able to differentiate between different classes of jobs. In the original WDQ validation article, four different occupational groups were compared in different work characteristics (professional, non-professionals, human-life occupations, and sales occupations). In line with this procedure, we examined the differences in work characteristics in four groups. First, we expected that "jobs in professional occupations would be higher on both the broad set of knowledge characteristics and the three components of autonomy than jobs in nonprofessional occupations, because professional occupations generally involve complex, non-routine work that requires flexible and adaptive behavior where higher levels of autonomy are present" (Morgeson & Humphrey, 2006, p. 1328). Second, we expected "jobs in nonprofessional occupations, compared with those in professional occupations, to be higher on physical demands and lower in the quality of work conditions because these jobs generally involve more physical exertion in less than optimal work environments" (Morgeson & Humphrey, 2006, p. 1328). Third, we expected jobs in health related occupations to be higher on task significance because behavior in these occupations directly affect human lives (Morgeson & Humphrey, 2006). Finally, we expected jobs in commercial occupations to be higher on interaction outside the organization because sales occupations are specifically focused on providing products and services to

others (Morgeson & Humphrey, 2006). According to this rationale we formulate the following hypotheses.

Hypothesis 2a.   Professional occupations will have higher levels of knowledge and autonomy characteristics than nonprofessional occupations.

Hypothesis 2b.   Nonprofessional occupations will have higher levels of physical demands and less positive work conditions than jobs in professional occupations.

Hypothesis 2c.   Jobs in health occupations will have higher levels of task significance than manufacturing occupations.

Hypothesis 2d.   Jobs in commercial occupations will have higher levels of interaction outside organization than manufacturing occupations.

Research on work design has found a positive relationship between task characteristics and attitudinal (i.e., job satisfaction) and behavioral (i.e., performance) outcomes (Fried & Ferris, 1987; Hackman & Oldham, 1980). In the original WDQ validation article, task and knowledge characteristics were compared to job satisfaction. In addition, some research has stated that the new work design characteristics (e.g., knowledge and social ones) will show a similar relation to job satisfaction and perceived performance (Grant et al., 2010; Grant & Parker, 2009). Following this rationale we expected that task, knowledge, and social characteristics would be related to both job satisfaction and perceived performance.

Hypothesis 3.   Task, knowledge and social characteristics will be positively related to job satisfaction (*Hypothesis 3a*) and perceived performance (*Hypothesis 3b*).

In the original WDQ validation article, social support was expected to incrementally predict satisfaction beyond task characteristics; however, due to changes in the nature of work that emphasizes more knowledge and service jobs than industrial ones (Grant & Parker, 2009), and due to the characteristics of Latin-American countries in which social relations are highly valued (Hofstede, 2001; House, Hanges, Javidan, Dorfman, & Gupta, 2004), it is expected that both knowledge and social characteristics will influence job satisfaction and perceived performance in an incremental rate. In addition, although some authors considered that context characteristics explained little variance in job satisfaction (Humphrey et al., 2007), others reported that work context characteristics had an important role in job satisfaction and different indicators of performance (Conlon & Dyne, 2004). Following this rationale we expected that social, knowledge, and work context characteristics would explain an important amount of variance for both job satisfaction and perceived performance.

Hypothesis 4.   Knowledge, social and work context characteristics will demonstrate incremental validity above the task characteristics for job satisfaction (*Hypothesis 4a*) and perceived performance (*Hypothesis 4b*).

Method

Translation

The translation of the WDQ into Spanish was accomplished through the translation/back-translation procedure recommended by Brislin (1980). The researchers first translated the WDQ from English to Spanish and then a bilingual professional translator with experience in the Business Administration field back-translated the Spanish version into English. Following the translation from English to Spanish, we compared the original questionnaire to the back-translated English version and differences were resolved through discussion among authors; the professional translator was

not aware of the study purpose. The wording of items was aimed to reflect general forms rather than specific idioms and expressions of the Spanish language as it is spoken in different countries. An initial version of the questionnaire was tested with a group of 18 workers from different occupational levels; once the questionnaire was administered, an interview with these workers was conducted in order to identify problems with the language expressions or wording. The resulting Spanish questionnaire used in the validation is presented in the Appendix.

Participants and Procedure

The sample was collected in Colombia, a country classified as an upper-middle-income economy with a GDP per capita (purchasing power parity) of US$ 9,125 (USA, US$ 43,063), an average economic growth from 2007 to 2011 of 4.5%, an annual employment growth of 3.5%, and 46.4% of its total work force being wage and salaried workers (USA, 93.2%); 77.2% of these salaried workers are distributed across four main economic sectors: wholesale and retail service (26.4%), health and social work (19.9%), agriculture, forestry, and fishing (17.5%), and manufacturing (13.4%); this same four economic sectors represent the 40.5% distribution of salaried workers in the USA (International Labour Organization, 2013a, 2013b).

Eight hundred forty-one Colombian employees participated in the study; however, 10 questionnaires were not usable due to participants not responding the WDQ section, leaving 831 useful questionnaires. The mean age for all participants was 34.9 years (range: 18-70, *SD* = 11 years); the mean tenure for all participants was 6.05 years (range: 1-51, *SD* = 7.48 years); 43% of workers were females (98.5 valid percent), 7.7% of respondents had completed education only at a high school/diploma level, 69.9% had completed undergraduate level (university, technical, or technological education), and 16.2% had completed postgraduate level or higher (93.8 valid percent).

Data were collected from three different samples. Sample 1 consisted of 279 full-time employees working for an organization that manufactures pumps, compressors, and valves (83.5% men; age: *M* = 31.2 years, *SD* = 8.2 years; education: *M* = 14.4 years, *SD* = 3.5 years); this sample included both blue and white collar workers. Sample 2 consisted of 89 full-time administrative employees working for a university (37% men; age: *M* = 39.3 years, *SD* = 8.8 years; education: *M* = 14.3 years, *SD* = 5.2 years). Sample 3 consisted

of 463 full-time employees working for different organizations (44% men; age: *M* = 36.2 years, *SD* = 12.3 years; education: *M* = 16.2 years, *SD* = 4.1 years). Sample 3 was obtained in the context of an organizational behavior course with junior-level business administration students. These students analyzed the work of a family member or acquaintance (job incumbent) who has worked full time for at least one year, and administrated the WDQ to the job incumbent (the students received specific training on the application of the questionnaire from one of the authors). This particular sampling strategy was employed so data could be collected on a wide range of jobs following the strategy used in the original work of Morgeson and Humphrey (2006) and is used when the goal is to sample a wide range of different jobs (e.g., Raymark, Schmit, & Guion, 1997). Workers in all samples filled a paper-and-pencil version of the WDQ and were informed about the confidential use of all information provided. The procedures were approved by the ethics review board of Pontificia Universidad Javeriana before the study began.

The distribution of the whole sample, depending on the economic sector in which job incumbents work, can be seen in Table 1. This distribution includes 17 out of 21 economic activities considered in the *International Standard Industrial Classification of All Economic Activities* (ISIC) (United Nations, 2008). However, it is important to note the under-representation of the *agriculture, forestry and fishing* sector, which has a very important role in the Colombian economy. The explanation for this under-representativeness is because sample was collected in an urban context and the access to these workers is difficult. Nevertheless, apart from this sector, the sample reflects the general formal labor market composition in Colombia.

Occupational classification. We created five broad occupational categories (i.e., professional, non-professional, health, commercial, and manufacturing occupations) to test the occupational focused hypothesis (*H*2a, *H*2b, *H*2c, *H*2d). For professional and non-professional classification, job incumbents self-reported if their occupation was professional (their work activities require a university degree) or nonprofessional (their work activities do not require a university degree). For the other categories (health, commercial, and manufacturing occupations), job incumbents self-reported the economic sector in which their organization was located using the ISIC classification (Table 1). For sample 1 (manufacture organization), all workers were classified in the manufacture

Table 1
Incumbent Population by ISIC[a]

ISIC occupation category	n	Age (years)		Job tenure (years)		Sex (% men)
		M	SD	M	SD	
Agriculture forestry and fishing	4	44.00	8.52	7.85	9.53	50
Mining and quarrying	14	41.43	11.91	7.98	9.21	50
Manufacturing	327	33.06	9.66	4.35	5.96	78
Construction	42	34.13	11.15	4.49	8.84	60
Wholesale and retail service	25	33.96	12.92	4.72	7.26	48
Transportation and storage	5	43.80	11.30	17.12	21.13	80
Accommodation and food service activities	9	29.78	13.34	3.43	4.70	22
Information and communication	22	37.62	13.70	4.55	6.12	50
Financial and insurance activities	37	36.19	11.49	8.16	7.61	49
Real estate activities	5	41.40	17.44	4.82	4.53	60
Professional, scientific and technical activities	29	33.55	11.30	3.52	4.65	24
Administrative and support service activities	9	34.56	7.13	6.25	8.57	67
Public administration and defense; compulsory social security	33	41.50	12.67	10.24	9.12	24
Education	128	38.93	10.12	10.07	8.16	33
Human health and social work activities	33	41.18	10.74	10.00	9.42	33
Arts, entertainment and recreation	2	36.00	12.73	11.38	15.50	100
Other services activities	5	35.36	7.86	2.00	1.03	20
No information	102	29.70	10.92	4.48	5.30	47
Total	831	34.92	11.12	6.05	7.47	56

Note. All samples included.

[a] International Standard Industrial Classification of All Economic Activities.

sector; for sample 2 (university), all workers were classified in the education sector; for sample 3 (different organizations), business administration students helped the job incumbents to report this information. The "health" category was composed of the jobs within the "human health and social work activities" of the ISIC classification, whereas the "non-health" category was composed of the jobs in the remaining occupations. The "commercial" category was composed of the jobs within the "wholesale and retail service" of the ISIC classification. Finally, the "manufacturing" category was composed of the jobs within the "manufacturing" group in the ISIC classification.

A one-way ANOVA was conducted in order to verify any possible differences in demographic variables among the samples. For age, tenure, and education, significant differences were detected: age, $F(2, 802) = 26.02$, $p \leq .01$ (sample 1, $M = 31.2$ years, sample 2, $M = 39.3$ years, sample 3, $M = 36.2$ years); tenure, $F(2, 811) = 42.88$, $p \leq .01$ (sample 1, $M = 3.1$ years, sample 2, $M = 10.3$ years, sample 3, $M = 7$ years); education, $F(2, 778) = 19.21$, $p \leq .01$ (sample 1, $M = 14.4$ years, sample 2, $M = 14.3$ years, sample 3, $M = 16.2$ years). Because of these results, analyses that use full-sample will be performed using these three variables as controls on the regression model of hypotheses 4a and 4b.

Measures

Work design. We used the WDQ developed by Morgeson and Humphrey (2006) that is a self-reporting measure that includes 77 items using a 5-point Likert scale ranging from 1 *(strongly disagree)* to 5 *(strongly agree)*. Cronbach's alpha of the original version of the WDQ ranged from .64 (ergonomics) to .95 (task variety and physical demands), with a mean alpha = .86.

Job satisfaction was measured using the 4-item job satisfaction scale developed by De Witte (2000) in its Spanish version used by Isaksson (2007). The scale uses a 5-point Likert scale ranging from 1 (*nothing important*) to 5 (*extremely important*). The Spanish version Cronbach's alpha = .81. An example item is: "La mayoría de los días estoy entusiasmado/a con mi trabajo."

Perceived performance was measured through the 6-item perceived performance scale developed by Abramis (1994) in its Spanish version used by Isaksson (2007). This scale asks respondents to think about their previous week at work and to rate how well they performed on six tasks, namely decision-making, performing without making mistakes, goal attainment, effort, taking initiatives, and taking responsibility. Five response categories were used, ranging from 1 (*very badly*) to 5 (*very well*). The Spanish version Cronbach's alpha = .79. An example item is: "¿En qué medida ha realizado satisfactoriamente la siguiente tarea? - Trabajar sin cometer errores."

Analyses

To test hypothesis 1, we used confirmatory factor analysis (CFA) conducted with AMOS 21 (Arbuckle, 2012). We applied a maximum likelihood estimation method; in order to run this analysis, no missing data will be allowed; taking into account that the missing data pattern was completely at random (Schafer & Graham, 2002) and that the missing data percentage was less than 2% per variable, a mean imputation was done using SPSS. Maximum skewness was -1.74 and maximum kurtosis was 3.83, which is among the recommended bounds for skewness |2.0| and kurtosis |7.0| (Hancock & Mueller, 2010).

Consistent with Morgeson and Humphrey (2006), we report various fit indices: χ^2/df ratio, comparative fit index (CFI), standardized root-mean-square residual (SRMR), and root-mean-square error of approximation (RMSEA). For χ^2/df ratio, a value of 2.0 indicates good fit. For CFI, values higher than .90 indicate good fit. For

SRMR, values lower than .08 indicate good fit. For RMSEA a value of .05 indicate good fit. We used the chi-square difference ($\Delta\chi^2$) to compare the models, and accepted the more parsimonious model if it was not significantly different from a more complex model. We tested five different models of work design using CFA techniques:

- 4-factor model examines the four broad categories of work characteristics (i.e., task, knowledge, social, and work context characteristics).
- 18-factor model examines the work characteristics without any divisions (i.e., autonomy and interdependence as unique factors).
- 19-factor model separates interdependence into its received and initiated components.
- 20-factor model separates autonomy into its three components, which includes autonomy in work scheduling, decision making, and work methods.
- 21-factor model separates both interdependence and autonomy into the identified components.

To test hypotheses 2a, 2b, 2c and 2d we used *t*-tests to compare means of two occupational segments: professional and non-professional workers, health and manufacturing workers, commercial and manufacturing workers. To test hypothesis 3a and 3b we performed bivariate Pearson correlations; finally, to test hypothesis 4a and 4b, we used hierarchical regression analyses aiming to compute incremental validity, which determined the variance accounted for knowledge, social, and work context characteristics in job satisfaction and perceived performance beyond the variance explained by task characteristics.

Results

Table 2 presents the descriptive statistics of WDQ Scales. The first two columns present the means and standard deviations; overall there is no evidence of floor or ceiling effects. The third column presents Cronbach's alpha (α). In overall, the scales of the Spanish version of the WDQ demonstrate very good internal consistency reliability, and only in ergonomics the coefficients are somewhat low in α (bellow .6). The fourth, fifth, and sixth columns present interrater reliability (intraclass correlation or ICC[2]; Bliese, 2000) and interrater agreement ($r_{wg(j)}$; James, Demaree, & Wolf, 1984). The ICC[2] assesses the extent to which incumbent judgments of their ISIC categories covary with each other relative to incumbents in other ISIC categories. The $r_{wg(j)}$ reflects the absolute level of agreement across raters and thus assesses the extent to which raters make similar mean-level ratings across their ISIC categories (Morgeson & Humphrey, 2006). Generally, these statistics suggest that the incumbents within an ISIC occupational category agree on their work characteristics assessment. As in the original WDQ, there were some exceptions: task variety, task significance, job complexity, and problem solving. These variables demonstrate essentially zero interrater reliability. As Morgeson and Humphrey (2006) pointed, this could be due to a "lack of between-job variability in this sample or that perhaps these aspects of work are not stable characteristics of a job and reflect idiosyncratic elements of job holders" instead (Morgeson & Humphrey, 2006, p. 1326). Yet, the high levels of interrater agreement ($r_{wg(j)}$) would suggest that these are not idiosyncratic perceptions because multiple incumbents agreed in their perceptions. Because job incumbents among an occupational category could hold different hierarchical levels, additional ICC[2] analyses using hierarchical level as the grouping variable were performed; results showed in Table 2 present ICC[2] values ranging from .54 to .97, $p \leq .05$, for 20 out of 21 work characteristics. Taken as a whole, these data suggest that it is appropriate

Table 2
Means, Standard Deviations and Reliability.

Construct	M	SD	Internal consistency[a]	ISIC Interrater reliability[b]	Hierarchical level Interrater reliability[b]	Interrater agreement[c]	Convergent-discriminant validity	
							AVE	MSV
Task characteristics								
Work scheduling autonomy	3.87	0.88	.86	.64**	.97**	.80	.68	.68
Decision-making autonomy	3.59	0.87	.84	.50**	.97**	.77	.65	.70
Work methods autonomy	3.72	0.82	.83	.61**	.96**	.80	.61	.70
Task variety	4.05	0.84	.91	−.03	.87**	.82	.71	.11
Task Significance	4.20	0.65	.76	.18	.83**	.88	.49	.12
Task identity	3.90	0.72	.82	.70**	.89**	.88	.57	.30
Feedback from job	4.00	0.75	.87	.54**	.66*	.88	.70	.30
Knowledge characteristics								
Job complexity	3.47	0.87	.80	−.49	.93**	.74	.58	.13
Information processing	3.98	0.76	.80	.45*	.97**	.84	.51	.48
Problem solving	3.63	0.74	.67	.07	.92**	.75	.36	.48
Skill variety	3.89	0.77	.91	.54**	.95**	.85	.73	.48
Specialization	3.63	0.79	.85	.58**	.95**	.80	.59	.36
Social characteristics								
Social support	4.00	0.65	.81	.69**	.54†	.92	.44	.17
Initiated interdependence	3.56	0.89	.75	.68**	.56*	.68	.53	.53
Received interdependence	3.49	0.89	.75	.41*	.77**	.67	.52	.53
Interaction outside organization	3.27	1.14	.92	.85**	.94**	.63	.75	.12
Feedback from others	3.23	0.93	.84	.73**	.96*	.74	.65	.17
Work context characteristics								
Ergonomics	3.54	0.82	.57	.66**	.92**	.69	.49	.34
Physical demands	2.31	1.10	.95	.79**	.98**	.73	.86	.21
Work conditions	3.43	0.88	.76	.86**	.97**	.67	.40	.34
Equipment use	2.85	0.96	.75	.65**	.88**	.50	.50	.21

Note. All samples included. α = Cronbach's alpha; AVE = average variance extracted; MSV = maximum shared squared variance.

[a] Coefficient alpha.
[b] ICC[2].
[c] $r_{wg(j)}$
† $p < .10$, * $p < .05$, ** $p < .01$.

to aggregate to the occupational category (ISIC) and there are high levels of agreement about a job's category on work characteristics.

Confirmatory Factor Analysis

In order to test the first hypothesis, that the Spanish WDQ version will fit a 21-factor structure, we run a set of five different CFAs. The results of our CFAs are presented in Table 3, broken down for each sample. First, for the full sample, the 4-factor model showed poor fit, as the fit indexes were all off the accepted levels. Second, the 18-, 19-, and 20-factor solutions showed adequate fit, with the SRMR and RMSEA reaching adequate levels, whereas the CFI was slightly low and the χ^2/df was slightly high. Finally, we tested the 21-factor solution; this model was the best fitted model overall, with the lowest χ^2/df ratio, SRMR, RMSEA and the highest CFI. This model was significantly better than the 18-factor model (χ^2 change = 627, df change = 57, $p < .001$), the 19-factor model (χ^2 change = 424, df change = 39, $p < .001$) and the 20-factor model (χ^2 change = 204, df change = 20, $p < .001$). These same results patterns are present in the separate analyses for each sample (Table 3); thus, like the original WDQ, the 21-factor model, which separates interdependence in two factors and autonomy in three factors, fits our data the best.

Additional evidence for a 21-factor structure is provided when the structure of task and social characteristics are studied separately. For task characteristics, a comparison between 5- and 7-factor model was developed (separating or integrating the three dimensions of autonomy). The 7-factor model performed better in χ^2/df ratio in comparison to the 5-factor model (χ^2 change = 372, df change = 11, $p < .001$), SRMR = .08, RMSEA = .07, CFI = .93). For social characteristics, a comparison between a 4- and a 5-factor

model was developed (separating or integrating the two dimensions of interdependence); the 5-factor model performed better in χ^2/df ratio than the 4-factor model (χ^2 change = 184, df change = 4, $p < .001$), SRMR = .06, RMSEA = .07, CFI = .92). In sum, these data fully support hypothesis 1.

Convergent/Discriminant Validity

Once we confirmed the 21-factor measurement model, it is important to assess the extent to which the items of a specific factor converge or share a high proportion of variance (convergent validity). In addition, it is also important to assess the extent to which a factor is truly distinct from other factors both in terms of how much it correlates with other factors and how distinctly items represent only this single factor (discriminant validity).

To evaluate convergent validity, two methods were used: (a) assessment of standardized factor loadings of observable variables and (b) average variance extracted (AVE) for each factor. For the first method, a comparison of factor loadings of each item was conducted, loadings estimates should be significant and with a factor loading of .50 or higher for the associated item; for the AVE method, "the average variance extracted is calculated as the mean variance extracted for the item loading on a [factor] and is a summary indicator of convergence" (Hair, Black, Babin, & Anderson, 2010, p. 687) and values greater than .50 are considered adequate.

On the other hand, to evaluate discriminant validity, a comparison between the AVE and the maximum shared squared variance (MSV) of each factor was carried out; the MSV represents the maximum shared squared variance found when comparing for any two factors (in this case, each factor was compared with all other 20 factors); with the square of the correlation estimate between these

Table 3
Results of Confirmatory Factor Analysis.

Model	χ^2	df	χ^2/df ratio	SRMR	RMSEA	CFI
4-factor						
Full sample	21544	2843	7.58	.12	.09	.49
Sample 1	8888	2843	3.13	.12	.08	.44
Sample 2	7319	2843	2.57	.14	.13	.31
Sample 3	14562	2843	5.12	.13	.09	.47
18-factor						
Full sample	6972	2696	2.59	.06	.04	.88
Sample 1	4659	2696	1.73	.07	.05	.82
Sample 2	5503	2696	2.04	.11	.11	.57
Sample 3	5613	2696	2.08	.06	.05	.87
19-factor						
Full sample	6769	2678	2.53	.06	.04	.89
Sample 1	4606	2678	1.72	.07	.05	.82
Sample 2	5449	2678	2.04	.11	.11	.58
Sample 3	5468	2678	2.04	.06	.05	.87
20-factor						
Full sample	6549	2659	2.46	.06	.04	.89
Sample 1	4523	2659	1.70	.07	.05	.83
Sample 2	5329	2659	2.00	.11	.11	.59
Sample 3	5342	2659	2.01	.06	.05	.88
21-factor						
Full sample	6345	2639	2.40	.06	.04	.90
Sample 1	4470	2639	1.69	.07	.05	.83
Sample 2	5274	2639	2.00	.11	.11	.60
Sample 3	5197	2639	2.00	.06	.05	.89

Note. SRMR = standardized root-mean-square; RMSEA = root-mean-square error of approximation; CFI = comparative fit index.

two factors, the AVE estimates should be greater than the MSV; this is because "a latent [factor] should explain more of the variance in its item measures that it shares with another construct" (Hair et al., 2010, p. 688); when the MSV values are lower than the AVE, the measure has good discriminant validity.

The results for convergent validity indicate that the standardized factor loadings of the WDQ indicate average estimate of .74, with just 4 out of 77 items below .50 (items 15, 18, 25, and 66).[1] For the AVE method, as shown in Table 2, the values of 5 out of 21 factors were below .50: task significance .49, problem solving .36, social support .44, ergonomics .49, and work conditions .40. Taken together, the evidence supports the convergent validity of the measurement model (with some limitations in the factors just mentioned).

On the other side, for discriminant validity, some values of MSV were below the AVE values, indicating some issues in the autonomy factors (work scheduling, decision making, and work methods), interdependence factors (initiated and received) and problem solving factor; however, the other 15 factors showed adequate levels of divergent validity.

Differences between Occupations

As in the original WDQ validation, our second set of hypotheses suggested that jobs within broad occupational categories would differ in certain work characteristics. First, hypothesis 2a predicted that knowledge and autonomy characteristics would be higher for jobs in professional than in nonprofessional occupations. As shown in Table 4, jobs in professional occupations had higher levels for all knowledge characteristics: job complexity, $t(677) = 6.56, r^2 = .05, p < .001$; information processing, $t(789) = 9.79, r^2 = .11, p < .001$; problem solving, $t(654) = 5.98, r^2 = .05, p < .001$; skill variety, $t(789) = 6.61, r^2 = .05, p < .001$; and specialization $t(789) = 3.93, r^2 = .02, p < .001$. Also, all autonomy characteristics were higher in professional occupations: work scheduling

autonomy, $t(789) = 10.96, r^2 = .14, p < .001$; decision-making autonomy, $t(696) = 9.54, r^2 = .11, p < .001$; and work methods autonomy, $t(789) = 8.90, r^2 = .09, p < .001$. Thus hypothesis 2a was fully supported.

Second, hypothesis 2b predicted that jobs in nonprofessional occupations would have higher levels of physical demands and lower levels of work conditions than jobs in professional occupations. As shown in Table 4, this hypothesis was supported, as jobs in nonprofessional occupations had higher levels for physical demands, $t(789) = 12.20, r^2 = .16, p < .001$, and lower levels of work conditions, $t(789) = 8.84, r^2 = .09, p < .001$. Third, hypothesis 2c predicted that jobs in health-focused occupations would have higher levels of task significance than manufacturing jobs. As shown in Table 4, this hypothesis was also supported, as the jobs in the health-focused occupations had higher levels of task significance, $t(41) = 2.78, r^2 = .06, p < .05$. Finally, hypothesis 2d predicted

Table 4
Means of Jobs across Occupational Categories.

Work characteristics	Occupational category	
	Professional	Nonprofessional
Job complexity[†,**]	3.63	3.23
Information processing[**]	4.20	3.69
Problem solving[†,**]	3.76	3.44
Skill variety[**]	4.03	3.68
Specialization[**]	3.71	3.48
Work scheduling autonomy[**]	4.15	3.51
Decision-making autonomy[†,**]	3.82	3.26
Work methods autonomy[**]	3.93	3.43
Physical demands[**]	1.91	2.79
Work conditions[**]	3.67	3.14
	Health-focused	Manufacturing
Task significance[†,*]	4.52	4.24
	Commercial	Manufacturing
Interaction outside organization[†,**]	3.86	2.77

Note. All samples included.
[†] Equal variances not assumed.
[*] $p < .05$,
[**] $p < .001$.

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[1] Full standardized factor loadings are available from the first author.

that jobs in commercial occupations would have higher levels of interaction outside organization than manufacturing occupations. This hypothesis was also supported as interaction outside organization was higher for jobs in commercial occupations than in manufacturing occupations, $t(29) = 4.97$, $r^2 = .21$, $p < .001$.

Relationshi Work Characteristics and Outcomes

Hypothesis 3a predicted that task, knowledge, and social characteristics would be positively related to job satisfaction. As shown in Table 5, all seven task characteristics were significantly related to job satisfaction, ranging in magnitude from .18 to .34 (mean correlation of .29). On the other hand, 4 out of 5 knowledge characteristics were significantly related to job satisfaction, ranging in magnitude from .15 to .23 (mean correlation of .19). Finally, for the social characteristics, only social support (.30) and feedback from others (.12) were related to job satisfaction, thus hypothesis 3a was supported for 13 out of 17 work characteristics.

Hypothesis 3b predicted that task, knowledge, and social characteristics would be positively related to perceived performance. As shown in Table 5, all seven task characteristics were significantly related to perceived performance, ranging in magnitude from .26 to .35 (mean correlation of .31). Also all five knowledge characteristics were significantly related to perceived performance, ranging in magnitude from .08 to .40 (mean correlation of .28). Finally, four out of five social characteristics were significantly related to perceived performance, ranging in magnitude from .13 to .31 (mean correlation of .19). Thus, hypothesis 3b was supported for 16 out of 17 work characteristics.

The last set of hypotheses predicted that knowledge, social, and context characteristics would incrementally predict job satisfaction (4a) and perceived performance (4b) beyond task characteristics. To test these hypotheses, we conducted a hierarchical regression in which we first regressed job satisfaction or perceived performance on three control variables (age, organizational tenure, and education) as the first step, task characteristics as the second step, knowledge characteristics as the third step, social characteristics as the fourth step, and work context characteristics as the fifth step. As shown in Table 6, for the job satisfaction model, control variables explained only small amounts of variance (5%); however, when knowledge, social, and work context characteristics are introduced, they explained additional amounts of variance $\Delta R^2 = .05$, $p < .01$. On the other hand, for the perceived performance model, the introduction of control variables explained small amounts of variance (6%) and the introduction of knowledge, social, and work context characteristics explained additional amounts of variance, $\Delta R^2 = .08$, $p < .01$.

Taking these small values into account, additional analyses were conducted for each sample. As shown in Table 6, the social characteristics explain medium to small amounts of variance for job satisfaction in the university, $\Delta R^2 = .15$, $p < .01$, manufacture, $\Delta R^2 = .03$, $p < .01$, and different organization sample $\Delta R^2 = .04$, $p < .01$. On the other hand, knowledge characteristics explained significant amounts of variance for perceived performance in the university, $\Delta R^2 = .17$, $p < .01$, and manufacture organization $\Delta R^2 = .07$, $p < .01$ samples. Therefore, our results (general and segregated) provide some support for hypothesis 4a and 4b, especially for knowledge and social characteristics; however, work context characteristics explained only a small amount of variance for both job satisfaction and perceived performance.

Common Method Bias

As with all self-reported data, there is a potential for the occurrence of common method bias; in order to control this, we used the common latent factor method (CLF), in which "items are allowed to load on their theoretical constructs, as well as on a latent common methods variance factor, and the significance of the structural parameters is examined both with and without the latent common methods variance factor in the model" (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003, p. 891). Taking this into account, we compared the original 21-factor model for the full sample (Table 3) and a 21-factor model in which the 77 items were allowed to load on their original factors, as well as on a CLF. The results for the 21-factor CLF model ($\chi^2 = 6125$, $df = 2635$, $p < .001$, $\chi^2/df = 2.33$, CFI = .90, SRMR = .06, RMSEA = .04) produced a small change in the model fit (χ^2 change = 219, df change = 4, $p < .001$, χ^2/df change = .07, no changes in CFI, SRMR, or RMSEA), what represented an slightly improved fit compared with the original 21-factor model presented in Table 3; however, when analyzing the significance of the structural parameters in both models (with and without the CLF), no significant changes in parameter estimates were found between the two models, these results indicating that the amount of variance due to common method bias is relatively small.

Discussion

The purpose of this study was to test the validity of a Spanish version of the WDQ developed by Morgeson and Humphrey (2006). The questionnaire was administered to 831 job incumbents working in 17 ISIC economic sectors. The CFA results indicated support for a 21-factor solution; this is in line with previous validations in German (Stegmann et al., 2010) and Italian (Zaniboni et al., 2013). Furthermore, the internal consistency reliabilities for almost all scales are above .70. As in the original validation (Morgeson & Humphrey, 2006), the Spanish version of the WDQ was able to detect expected differences in work characteristics across different sets of occupations, providing construct validity evidence. In addition, we found that knowledge, social, and context characteristics incrementally predict job satisfaction and perceived performance beyond task characteristics.

As our results supported the validity of the Spanish version of the WDQ, the study further contributes to the generalization of work characteristics taxonomy proposed by Morgeson and Humphrey (2006). Thus, our results from three Colombian samples provide further evidence for the generalizability of the scale in different cultural settings. The WDQ validation in a cultural setting different from the one in which they were developed and validated (USA, Western Europe) gives additional support to the structure of work characteristics that are relevant for all works and organizations.

The confirmation of the 21-factor structure was expected, as Colombia during the last 20 years has opened its borders to new organizations and work arrangements and has begun to switch from an agriculture and production economy to a more intense service economy (Ogliastri, 2007). This is consistent with the importance given to social and knowledge characteristics which are distinctive of service organizations beyond the traditional task and work context characteristics that are typical of production industries.

The Spanish version of the WDQ obtained better psychometric results than similar work characteristics instruments that were tested in the Spanish speaking countries context such as the JDS (Fuertes et al., 1996) and presented a clear internal structure of the model, showing high reliability among almost all 21 work characteristics. The work context characteristic that showed some low reliability (ergonomics) included a reverse coded item, a relatively common phenomena that is also presented in other organizational behavior questionnaire validations (Podsakoff et al., 2003). However, when the problem item is eliminated, the factor reliability improves considerably ($\alpha = .84$). In addition, this work characteristic was the one with the lowest reliability in the original validation of Morgeson and Humphrey (2006).

Table 5
Intercorrelations among Study Variables.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Task characteristics																						
1. Work scheduling autonomy	–																					
2. Decision-making autonomy	.69**	–																				
3. Work methods autonomy	.69**	.72**	–																			
4. Task variety	.27**	.31**	.27**	–																		
5. Task significance	.24**	.27**	.25**	.35**	–																	
6. Task identity	.37**	.33**	.36**	.22**	.33**	–																
7. Feedback from job	.29**	.33**	.37**	.27**	.37**	.57**	–															
Knowledge characteristics																						
8. Job complexity	.06	.08*	.06	.23**	.09*	−.09*	−.05	–														
9. Information processing	.28**	.29**	.32**	.43**	.33**	.23**	.26**	.35**	–													
10. Problem solving	.22**	.31**	.29**	.31**	.30**	.09*	.19**	.17**	.52**	–												
11. Skill variety	.23**	.30**	.29**	.42**	.38**	.21**	.24**	.26**	.55**	.56**	–											
12. Specialization	.18**	.29**	.27**	.21**	.36**	.25**	.26**	.13*	.42**	.41**	.55**	–										
Social characteristics																						
13. Social support	.24**	.26**	.25**	.22**	.35**	.36**	.38**	−.06	.18**	.16**	.21**	.21**	–									
14. Initiated interdependence	.10**	.13**	.15**	.24**	.25**	.10**	.10**	.10**	.27**	.24**	.26**	.24**	.13**	–								
15. Received interdependence	.08*	.10**	.12**	.21**	.20**	.05	.07	.13**	.29**	.19**	.23**	.18**	.07*	.56**	–							
16. Interaction outside organization	.14**	.17**	.13**	.16**	.21**	.20**	.18**	.03	.20**	.17**	.14**	.08*	.30**	.09**	.17**	–						
17. Feedback from others	.10**	.13**	.09*	.11**	.14**	.22**	.29**	−.07*	.14**	.09*	.06	.13**	.43**	.07*	.04	.27**	–					
Work context characteristics																						
18. Ergonomics	.27**	.24**	.25**	.11**	.12**	.27**	.20**	−.01	.13**	.02	.07*	.08*	.30**	.06	.07*	.09**	.19**	–				
19. Physical demands	−.24**	−.16**	−.17**	−.03	.01	−.12**	−.07*	−.15**	−.15**	−.02	−.01	.10**	−.07*	.08*	−.03	−.08*	−.00	−.45**	–			
20. Work conditions	.29**	.20**	.25**	.08*	.06	.25**	.19**	−.05	.15**	.04	.05	.02	.24**	.01	.04	.17**	.19**	.46**	−.40**	–		
21. Equipment use	−.05	.04	.02	.10**	.18**	.06	.11**	−.06	.10**	.11**	.19**	.37**	.06	.20**	.16**	.03	.11**	−.06	.41**	−.11**	–	
Outcomes																						
22. Job satisfaction	.34**	.33**	.31**	.18**	.27**	.31**	.31**	.05	.15**	.15**	.23**	.23**	.30**	.03	.04	.06	.12**	.25**	−.11**	.17**	.07	–
23. Perceived performance	.28**	.32**	.33**	.26**	.35**	.30**	.35**	.08**	.29**	.26**	.37**	.40**	.31**	.20**	.15**	.04	.13**	.17**	.02	.09**	.17**	.37**

Note. All samples included. *n* ranges from 810 to 831.

* $p < .05$,
** $p < .01$.

Table 6
Incremental Validity of Work Characteristics on Job Satisfaction and Perceived Performance.

Predictor	Work outcomes							
	Job satisfaction				Perceived performance			
	Sample 1	Sample 2	Sample 3	All samples	Sample 1	Sample 2	Sample 3	All samples
Step 1 R^2 Age, Tenure, Education	.06**	.06	.05**	.05**	.07**	.05	.09**	.06**
Step 2 ΔR^2 Task Characteristics	.19**	.18*	.18**	.16**	.17**	.31**	.25**	.20**
Step 3 ΔR^2 Knowledge Characteristics	.02**	.05*	.02**	.01**	.07**	.17**	.01**	.05**
Step 4 ΔR^2 Social Characteristics	.03**	.15**	.04**	.02**	.04**	.05**	.03**	.02**
Step 5 ΔR^2 Work Context Characteristics	.03**	.01*	.02**	.02**	.01**	.03**	.00**	.01**
Total R^2	.33**	.45*	.31**	.26**	.36**	.61**	.38**	.34**

** $p < .01$,
* $p < .05$.

Although all hypotheses were supported in some degree, two unexpected relations emerged in the present Spanish validation. The first unexpected result was the differential role of knowledge and social characteristics in job satisfaction and perceived performance (Table 6). The ΔR^2 in job satisfaction (14%) due to social characteristics, and in perceived performance (19%) due to knowledge characteristics in the university sample may be related with the observations of Michael Campion in the interdisciplinary approach to work design (Campion, 1988), that states that different job design approaches influence different outcomes (e.g., the motivational approach is more correlated with satisfaction outcomes than the rest of the approaches); in this case, what was found was that in this sample, some work characteristics influence different outcomes. These results could indicate that when a work redesign is imminent (especially in knowledge-oriented organizations as the university), it is important to pay attention to which specific outcomes are of interest to change and depending on this, it will be necessary to evaluate only some work characteristics.

The second unexpected result was related to some differences in the convergent and discriminant validity results on autonomy and social characteristics (Table 2). From the psychometric perspective, these results on low divergent validity among autonomy (work scheduling, decision-making and, work methods) and interdependence (initiated and received) may be explained by the fact that they are composites of a more general factor (autonomy and interdependence) and for this reason it is expected that MSV values will be greater than those in the other variables.

Finally, we have to be cautious with the problem solving variable, due to its non-significant interrater reliability, low AVE, and high MSV. These results indicate that this particular variable share a high portion of variance with other variables, in particular with information processing. Because of this, the analysis of these variables should be treated with caution in future Spanish WDQ administrations.

Implications for Practice and Research

For practitioners, a broader range of work design potentials is possible beyond the traditional five job characteristics of the JDS; however, it is important that practitioners be fully aware of potential cultural influences in the work design practice. In the case of Latin-America countries, a deep collectivism value can be found, and in Colombia there is an important role of collectivism and rejection to individualism (Ogliastri, 2007). In an article from the GLOBE project (Dorfman, Javidan, Hanges, Dastmalchian, & House, 2012), the authors report that the autonomous dimension (tendencies to act independently without relying on others) is strongly negative related to institutional collectivism (degree in which organizational practices encourage and reward collective distribution of resources and collective action); this relation is important in order to redesign (increase) autonomy in positions where high institutional collectivism is present.

With regard to research, the WDQ is a tool that allows to investigate the impact of different work configurations on organizational and personal outcomes and let open a research line of the influence of different mediators and moderators in the relation between work characteristics and personal and organizational outcomes (e.g., cultural characteristics).

Limitations

Two major drawback limited the present research: first, the presence of some level of common method bias, which implies that the results must be interpreted with caution, even though the CLF test results indicated that variance due to common method is between the acceptable limits. This is consistent with previous research on common method variance, which has concluded that while common method bias may be present, it may not always significantly affect the results and conclusions drawn from the data (Crampton & Wagner, 1994; Doty & Glick, 1998). The second limitation was the sample method selection; although we used three different samples and almost all occupational groups of the ISIC were considered, some groups were sub-represented (e.g., arts, entertainment, and recreation); besides, it is also important to consider that half of the labor market in Colombia is informal and the conclusions of this study can apply only to the workers that are inside the formal labor market (50% of the Colombian total labor force). Future research should consider the structure of work characteristics in jobs included in the informal labour market. They represent in developing countries an important amount of the total economy and deserve a better analysis and understanding.

Conclusion

The Spanish version of the WDQ is a validated and reliable instrument to assess work characteristics in the Spanish speaking context. Our study provided evidence for the validity of a Spanish version of the scale and presented further support for the generalization of the 21-factor of work design characteritics in different cultural settings that included particular relations between knowledge and social characteristics and job satisfaction and perceived performance. We hope that the introduction of this instrument will stimulate further research and practice on work design in Spanish speaking countries.

Conflict of Interest

The authors of this article declare no conflict of interest.

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Appendix.

Las siguientes preguntas hacen referencia a varias características que se pueden presentar en su actual trabajo. Usando la escala que se presenta a continuación, indique en qué medida está de acuerdo con cada afirmación (1 = *muy en desacuerdo*, 2 = *algo en desacuerdo*, 3 = *ni de acuerdo, ni en desacuerdo*, 4 = *algo de acuerdo*, 5 = *muy de acuerdo*).

Original English Version	Adapted Spanish Version
Task Characteristics	**Características de la Tarea**
Work Scheduling Autonomy	Autonomía en la organización del trabajo
The job allows me to make my own decisions about how to schedule my work.	El trabajo me permite tomar mis propias decisiones sobre cómo organizarlo.
The job allows me to decide on the order in which things are done on the job.	El trabajo me permite decidir el orden en que se hacen las cosas.
The job allows me to plan how I do my work.	El trabajo me permite planificar cómo hacer mis tareas.
Decision-Making Autonomy	Autonomía en la toma de decisiones
The job gives me a chance to use my personal initiative or judgment in carrying out the work.	El trabajo me da la oportunidad de usar mi iniciativa o criterio para realizarlo.
The job allows me to make a lot of decisions on my own.	El trabajo me permite tomar muchas decisiones por mi cuenta.
The job provides me with significant autonomy in making decisions.	El trabajo me proporciona mucha autonomía en la toma de decisiones.
Work Methods Autonomy	Autonomía en los Métodos Utilizados en el Trabajo
The job allows me to make decisions about what methods I use to complete my work.	El trabajo me permite tomar decisiones sobre los métodos que uso para realizarlo.
The job gives me considerable opportunity for independence and freedom in how I do the work.	El trabajo me ofrece muchas posibilidades de independencia y libertad para decidir cómo hacerlo.
The job gives me considerable opportunity for independence and freedom in how I do the work.	El trabajo me permite decidir por mi cuenta cómo organizarme para hacerlo.
Task Variety	Variedad de la Tarea
The job involves a great deal of task variety.	El trabajo incluye una gran variedad de tareas.
The job involves doing a number of different things.	El trabajo implica hacer muchas cosas diferentes.
The job requires the performance of a wide range of tasks.	El trabajo requiere la realización de una amplia gama de tareas.
The job involves performing a variety of tasks.	El trabajo implica la realización de una considerable variedad de tareas.
Task Significance	Significado de la Tarea
The results of my work are likely to significantly affect the lives of other people.	Es bastante probable que, el resultado de mi trabajo tenga efectos significativos en las vidas de otras personas.
The job itself is very significant and important in the broader scheme of things.	El trabajo para mí es significativo e importante.
The job has a large impact on people outside the organization.	El trabajo tiene un impacto importante en personas externas a la organización.
The work performed on the job has a significant impact on people outside the organization.	El resultado de este trabajo tiene un impacto significativo en personas externas a la organización.
Task Identity	Identidad de la Tarea
The job involves completing a piece of work that has an obvious beginning and end.	El trabajo implica completar partes del mismo que tienen un comienzo y final claros.
The job is arranged so that I can do an entire piece of work from beginning to end.	El trabajo está organizado de manera que puedo realizar una unidad completa del mismo, desde el comienzo hasta el final.
The job provides me the chance to completely finish the pieces of work I begin.	El trabajo me proporciona la oportunidad de terminar lo que empiezo.
The job allows me to complete work I start.	El trabajo me permite completar las actividades que inicio.
Feedback From Job	Retroalimentación desde el Trabajo
The work activities themselves provide direct and clear information about the effectiveness (e.g. quality and quantity) of my job performance.	Las actividades de mi trabajo me proporcionan por sí mismas información directa y clara sobre la eficacia de mi desempeño en el mismo (por ejemplo, calidad y cantidad).
The job itself provides feedback on my performance.	El trabajo en sí mismo me proporciona retroalimentación sobre mi desempeño.
The job itself provides me with information about my performance.	El trabajo en sí mismo me proporciona información sobre mi desempeño.

Original English Version	Adapted Spanish Version
Knowledge Characteristics	**Características del Conocimiento**

Job Complexity

Complejidad del Trabajo

The job requires that I only do one task or activity at a time. (reverse scored)

El trabajo requiere hacer sólo una tarea o actividad a la vez. (codificación inversa)

The tasks on the job are simple and uncomplicated. (reverse scored)

Las tareas del trabajo son simples y sin complicaciones. (codificación inversa)

The job comprises relatively uncomplicated tasks. (reverse scored)

El trabajo abarca tareas relativamente sencillas. (codificación inversa)

The job involves performing relatively simple tasks. (reverse scored)

El trabajo incluye el desempeño de tareas relativamente simples. (codificación inversa)

Information Processing

Procesamiento de Información

The job requires me to monitor a great deal of information.

El trabajo requiere manejar una gran cantidad de información.

The job requires that I engage in a large amount of thinking.

El trabajo requiere pensar mucho.

The job requires me to keep track of more than one thing at a time.

El trabajo requiere realizar más de una cosa a la vez.

The job requires me to analyze a lot of information.

El trabajo me exige analizar una gran cantidad de información.

Problem Solving

Solución de Problemas

The job involves solving problems that have no obvious correct answer.

El trabajo incluye la solución de problemas que no tienen una respuesta correcta clara.

The job requires me to be creative.

El trabajo requiere que sea creativo.

The job often involves dealing with problems that I have not met before.

El trabajo implica a menudo gestionar problemas que no me he encontrado antes.

The job requires unique ideas or solutions to problems.

El trabajo requiere ideas y soluciones únicas para los problemas.

Skill Variety

Variedad de Habilidades

The job requires a variety of skills.

El trabajo requiere una variedad de destrezas.

The job requires me to utilize a variety of different skills in order to complete the work.

El trabajo requiere la utilización distintas destrezas para realizarlo.

The job requires me to use a number of complex or high-level skills.

El trabajo requiere la utilización de una variedad de destrezas complejas o de alto nivel.

The job requires the use of a number of skills.

El trabajo requiere el uso de diversas destrezas.

Specialization

Especialización

The job is highly specialized in terms of purpose, tasks, or activities.

El trabajo es altamente especializado en su propósito, tareas o actividades.

The tools, procedures, materials, and so forth used on this job are highly specialized in terms of purpose.

Las herramientas, procedimientos, materiales etc. utilizados en este trabajo son altamente especializados debido a su propósito.

The job requires very specialized knowledge and skills.

El trabajo requiere conocimientos y destrezas muy especializados.

The job requires a depth of knowledge and expertise.

El trabajo requiere un conocimiento profundo y ser experto.

Social Characteristics	**Características Sociales**

Social Support

Apoyo Social

I have the opportunity to develop close friendships in my job.

En mi trabajo tengo la oportunidad de desarrollar buenas amistades.

I have the chance in my job to get to know other people.

En mi trabajo tengo la oportunidad de conocer a otras personas.

I have the opportunity to meet with others in my work.

En mi trabajo tengo la oportunidad de encontrarme con otros.

My supervisor is concerned about the welfare of the people that work for him/her.

Mi supervisor se interesa por el bienestar de las personas que trabajan para él o ella.

People I work with take a personal interest in me.

Las personas con las que trabajo se interesan por mí personalmente.

People I work with are friendly.

Las personas con las que trabajo son amistosas.

Initiated Interdependence

Interdependencia Iniciada

The job requires me to accomplish my job before others complete their job.

El trabajo requiere que realice mis tareas antes de que otros completen las suyas.

Other jobs depend directly on my job.

Otros trabajos dependen directamente del mío.

Unless my job gets done, other jobs cannot be completed.

Si mi trabajo no está terminado no se puede completar el de otros.

Received Interdependence

Interdependencia Recibida

The job activities are greatly affected by the work of many different people for its completion.

Las actividades de mi trabajo se ven muy afectadas por el de otras personas.

My job depends on the work of many different people for its completion.

La realización de este trabajo requiere la aportación del trabajo de otras personas diferentes.

My job cannot be done unless others do their work.

No puedo hacer mi trabajo a menos que otros hagan el suyo.

Original English Version	Adapted Spanish Version
Interaction Outside Organization	Interacción fuera de la Organización
The job requires spending a great deal of time with people outside my organization.	El trabajo requiere emplear mucho tiempo con personas externas a mi organización.
The job involves interaction with people who are not members of my organization.	El trabajo implica interacción con personas que no son miembros de mi organización.
On the job, I frequently communicate with people who do not work for the same organization as I do.	En el trabajo con frecuencia me comunico con personas que no trabajan para la misma organización que yo.
The job involves a great deal of interaction with people outside my organization.	El trabajo implica mucha interacción con personas externas a mi organización.
Feedback From Others	Retroalimentación por parte de Otros
I receive a great deal of information from my manager and co-workers about my job performance.	Recibo mucha información de mi supervisor inmediato y de mis compañeros sobre mi desempeño en el trabajo.
Other people in the organization, such as managers and co-workers, provide information about the effectiveness (e.g. quality and quantity) of my job performance.	Otras personas de la organización, como supervisores y compañeros, me proporcionan información sobre la eficacia de mi desempeño en el trabajo (por ejemplo, calidad y cantidad).
I receive feedback on my performance from other people in my organization (such as my manager or co-workers).	Recibo información de otras personas en mi organización (como mi supervisor inmediato o compañeros) sobre mi desempeño.
Work Context	**Contexto del Trabajo**
Ergonomics	Ergonomía
The seating arrangements on the job are adequate (e.g. ample opportunities to sit, comfortable chairs, good postural support).	La disposición de los asientos en el trabajo es adecuada (por ejemplo, amplias oportunidades para sentarse, sillas cómodas, buen apoyo postural).
The work place allows for all size differences between people in terms of clearance, reach, eye height, leg room, etc.	El lugar del trabajo se ajusta a las diferencias personales en término de espacio, alcance, altura de la vista, espacio para las piernas, etc.
The job involves excessive reaching. (reverse scored)	El trabajo implica excesivos esfuerzos para alcanzar las cosas. (codificación inversa)
Physical Demands	Demandas Físicas
The job requires a great deal of muscular endurance.	El trabajo requiere una gran resistencia muscular.
The job requires a great deal of muscular strength.	El trabajo requiere una gran fuerza muscular.
The job requires a lot of physical effort.	El trabajo requiere mucho esfuerzo físico.
Work Conditions	Condiciones del Trabajo
The work place is free from excessive noise.	El lugar de trabajo está libre de ruidos excesivos.
The climate at the work place is comfortable in terms of temperature and humidity.	El clima en el lugar de trabajo es confortable (por ejemplo: temperatura y humedad).
The job has a low risk of accident.	El trabajo tiene un riesgo de accidente bajo.
The job takes place in an environment free from health hazards (e.g., chemicals, fumes, etc.).	El trabajo se hace en un entono libre de peligros para la salud (por ejemplo sustancias químicas, gases, etc.).
The job occurs in a clean environment.	El trabajo se hace en un ambiente limpio.
Equipment Use	Uso de Equipo
The job involves the use of a variety of different equipment.	El trabajo implica el uso de distintos equipamientos.
The job involves the use of complex equipment or technology.	El trabajo incluye el uso de equipos o tecnologías complejas.
A lot of time was required to learn the equipment used on the job.	Se requiere mucho tiempo para aprender el uso de los equipos relevantes en el trabajo.

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