

Spanish version of Bus Drivers' Job Demands Scale (BDJD-24)

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Abstract

Background: Karasek and Theorell's Job Demands-Control Model argues that adverse health-related outcomes, both psychological and physiological, arise from a combination of high job demand and a low level of job control. The objective was to adapt Meijman and Kompier's Bus Drivers' Job Demands Scale (BDJD-24), which enables us to assess the job demands of bus drivers, to Spanish. **Method:** The final version of the Spanish adaptation was applied to a sample made up of 287 bus drivers living in Spain (80.1% men and 19.9% women), whose average age was 40.44 (SD=11.78). **Results:** The results yielded a three-factor structure for the scale used: Time Pressure, Safety, and Passengers. These findings confirm that the Spanish version replicates the factor structure of the original English scale. The reliability of the three subscales was acceptable, ranging from .75 to .84. Furthermore, the subscales were also related to different external correlates and to other scales and showed good convergent and criterion validity. **Conclusions:** The present instrument can be used to evaluate job demands of bus drivers, as its psychometrics are substantially sound.

Keywords: job demand-control model, transport, bus drivers, scale, instrumental study.

Resumen

Versión española de la Bus Drivers' Job Demands Scale (BDJD-24). **Antecedentes:** el modelo de Job Demands-Control de Karasek y Theorell considera que los resultados nocivos tanto psicológicos como fisiológicos relacionados con la salud son una combinación de una alta demanda laboral y un bajo control sobre el trabajo. El objetivo ha sido adaptar al español la escala Bus Drivers' Job Demands Scale (BDJD-24), de Meijman y Kompier, que permite evaluar las demandas laborales de los conductores de autobús. **Método:** la muestra a la que se aplicó la versión final de la adaptación española constaba de 287 conductores de autobús residentes en España (80,1% hombres y 19,9% mujeres) con una edad media de 40,44 años (DT= 11,78). **Resultados:** la escala analizada presentó una estructura trifactorial: Presión del Tiempo, Seguridad y Pasajeros. De esta forma se confirma que la versión española replica la estructura factorial de la original inglesa. Las tres subescalas mostraron una fiabilidad aceptable que oscila entre 0,75 y 0,84. Además, éstas fueron relacionadas con diversos correlatos externos y con otras escalas, mostrando una buena validez convergente y criterial. **Conclusiones:** el presente instrumento puede utilizarse para evaluar las demandas del trabajo de los conductores de autobús dado que tiene una apreciable bondad psicométrica.

Palabras clave: modelo demanda-control, transporte, conductores autobús, escala, estudio instrumental.

According to the Programme on Safety and Health at Work and the Environment (Safe Work) of the International Labour Organization (2011), over 160 million workers fall ill every year due to occupational hazards. In order to cut down illnesses this programme intends to promote prevention for workers in hazardous occupations and sectors which, for example, have very demanding work hours. This is the case of bus drivers. It also aims to create diagnostic tools that will enable us to evaluate job health and work hazards, including psychosocial hazards.

One important risk factor that may lead to health problems at work is occupational strain. The Job Demand Control (JDC) Model by Karasek and his collaborators (Karasek, 1979; Karasek & Theorell, 1990; Karasek et al., 1998) has been used in numerous studies and its cornerstone is control. Consequently, Cieslak,

Knoll and Luszczynska (2007) consider that neuroticism plays an important moderating role in the relations between social support from work-related sources and two work strain characteristics (job demands and job control). Furthermore, Daniels and Harris (2005) found that control and support can enhance the effectiveness of problem-focused as well as certain other forms of coping. In addition, Fernet, Guay and Senécal (2004) point to a three-way interaction effect between job demands, job control and work self-determination in predicting each dimension of burnout (emotional exhaustion, depersonalization, and personal accomplishment). Finally, Janssen, Peeters, de Jonge, Houkes and Tummers (2004) have shown that the association between psychological job demands and emotional exhaustion is partially mediated by negative work-home interference (NWI).

The present model points to two possible results (strain and learning) as an outcome of various combinations of job demands (quantitative work load) and job control (defined as the capacity to take job-related decisions, in combination with the capacity to use and develop skills). The JDC considers that both psychological (for example, job burnout) and physiologically detrimental health-related outcomes (for example, an increase in musculoskeletal

complaints) are the result of a combination of high demand and low control. Workers with high strain (Karasek & Theorell, 1990), have a high demand level because their job post gives them few decision-making options. This option defines the job post of bus drivers. Hence, De Croon, Sluiter, Blonk, Broersen and Frings-Dresen (2004) consider that the bus driver's job is highly demanding because it entails sustained physical and mental effort. There are different types of demands such as physical demands (e.g., driving posture), social demands (e.g., loneliness) as well as demands arising from job organisation (e.g., schedules).

Consequently, employees with little demand and high control in their job posts, such as repairmen, installers, etc. (Karasek & Theorell, 1990), have lower than average strain in their job because they are able to optimally address each of the few challenges that present themselves in their work (due to the control they have).

The present model also indicates that learning is the outcome of an active job which entails high demand and a high level of control; employees with active jobs, such as lawyers, doctors, teachers and engineers (Karasek & Theorell, 1990), are able to transfer the energy generated by a high level of demand through problem solving, which in turn is facilitated by a high level of control. In this respect, active workers learn more efficaciously. They master relevant skills better and are more productive. In contrast, passive workers (low demand, low control) such as receptionists and cleaners (Karasek & Theorell, 1990) often show a lack of motivation in their work and low productivity because of the lack of challenges in their job. All this is accompanied by frequent restrictions in their job post. The JDC model also incorporates forecasts on physical, psychological and performance results.

The JDC model has been extended since it was first drawn up, and an additional job factor, social support, has been added (Johnson & Hall, 1988; Johnson, Hall, & Theorell, 1989). This version is known as the Job Demand Control Support (JDSC) Model. It puts forward that the absence of social support from work colleagues combined with high demand and low control leads to very detrimental consequences for employees' health and well-being ("iso-strain hypothesis"). Furthermore, a new version of the model (Karasek & Theorell, 1990) lays emphasis on the relationships between work and personality. More specifically, the model proposes that prolonged exposure to active work conditions associated with a greater sensation of dominance and trust induces positive changes in personality, whereas long-term exposure to high strain conditions is associated with high anxiety levels, which, in turn, promote a negative personality (Karasek & Theorell, 1990). In this respect, professional drivers have low job support given the very nature of their work (Tucker & Rutherford, 2005).

The Bus Drivers' Job Demands Scale (BDJD-24) forms a part of the JDC model (Meijman & Kompier, 1998). The English version of the BDJD-24 consists of 24 items and three factors: Time Demands, Safety and Passengers. To draw up the scale, the authors initially started off with a pool of 62 items, which they formulated based on the critical incidents explained by bus drivers from various companies.

Different research studies (Akerboom & Maes, 2006; Daniels, 1999; Daniels & Harris, 2005; DeLange, Taris, Kompier, Houtman, & Bongers, 2003; Hughes & Parkes, 2007; López-Araújo & Oisca-Segovia, 2011; McClenahan, Giles, & Mallett, 2007; Preston, 2008; Van der Doef & Maes, 1999) have shown that high demands and low control are related to psychological malaise. Bus drivers constitute a clear example of high stress at work (high-stress

occupation). The characteristic features of this occupation are high job demand, low control and low support (Carrere, Evans, Palsane, & Rivas, 1991; Kompier & Di Martino, 1995).

Some research studies (De Croon, Blonk, de Zwart, Frings-Dresen, & Broersen, 2002; Duffy & McGoldrick, 1990; Evans & Johansson, 1998; Kompier, 1988; Kompier, Van den Berg, Aust, & Siegrist, 2000) indicate that absenteeism and job hazards are greater in professional drivers (bus, trucks and taxis) than in other occupational groups. Various job-related negative repercussions have been associated with the health of this collective (Aronsson & Rissler, 1998; Dorn, Stephen, af Wählberg, & Gandolfi, 2010; Taylor & Dorn, 2006). These are fatigue (Ahsberg, 2000; Dorrian, Hussey, & Dawson, 2007; Lal & Craig, 2001; Wright & Cropanzano, 1998), strain (Strahan, Watson, & Lennonb, 2008), gastrointestinal disorders (Winkleby, Ragland, Fisher, & Syme, 1988), difficulty sleeping (Duffy & McGoldrick, 1990; Philip, 2005), psychological and physical symptoms (Machin & Hoare, 2008), states of depression (Da Silva-Junior, Nunes de Pinho, Tulio de Mello, Sales de Bruin, & Carvalhedo de Bruin, 2009), lower back pain (Issever, Onen, Sabuncu, & Altunkaynak, 2002), musculoskeletal complaints (Anderson, 1992; Robb & Mansfield, 2007), high blood pressure (Belkic, Pavolic, Djordjevic, Ugljesic, & Mickovic, 1992), and heart disease (Krantz & McCeney, 2002).

In the present study, we have used a series of variables to demonstrate the scale's convergent validity adapted to the Spanish language. First of all, we used external correlates such as, for example, "the number of passengers who use the bus when you are driving", "the number of kilometres you do", "the number of traffic accidents you have been involved in", "the number of orders received from your supervisor", "the number of stops you make", "the number of days you have felt tired and without energy over the last week", and "the number of days you have gone in to work ill".

Furthermore, we took into account two constructs as validity indexes. The first was psychological wellbeing as an index of mental health on the job (Cifré & Salanova, 2000). Psychological wellbeing, assessed using the GHQ-12 (Sánchez-López & Dresch, 2008), has three components: Success in coping, self-esteem and stress. This scale does not focus so much on personality aspects but rather on the stressful situations that prevent a person from functioning normally (Cifré & Salanova, 2000). Thus, Blasco, Prieto and Cornejo (2003) have related stress with a higher accident rate among drivers.

The second construct was safety behaviours (personal and in the vehicle) and psychophysiological disorders (Boada-Grau, Sánchez-García, Prizmic-Kuzmica, & Vigil-Colet, 2012). Hence, safety behaviours are the outcome of a social influence process whereby the safety behaviour level contributes to determining the job's real risk level (Meliá, 2007). Furthermore, psychophysiological disorders were also taken into account, given that their prevalence among professional drivers is significant (Tse, Flin, & Mearns, 2006).

In line with all the above, this study informs on the psychometric properties of the Spanish version of the Bus Drivers' Job Demands Scale (BDJD-24) by Meijman and Kompier (1998), which assesses tight schedules, safety behaviours in response to the demands of traffic and interaction with passengers. This study sets three objectives: (1) to check the internal structure empirically, (2) to analyse factor reliability, and (3) to draw up the convergent

validity indices of the investigated scale. Finally, the development of this scale entails certain advantages, such as: it cuts down the time it takes to respond to the items. It also minimises bias related to tiredness in the case of a lengthier instrument and it enables us to quickly evaluate the items and their factors whilst providing initial valuable information as a screening (Lelito, Palumbo, & Hanley, 2001).

Method

Participants

A total of 287 bus drivers, residents in Spain took part in the study. Of them, 80.1% were men and 19.9% were women. As far as their marital status is concerned, the distribution was as follows: married (55.1%), civil union (10.1%), single (20.9%), divorced or separated (12.9%) and widow/er (1%). The drivers had different educational backgrounds: Without studies (2.2%), certificate of completion (16.8%), completed compulsory education or equivalent (48.2%), completed secondary education or equivalent (27%) and university studies (5.8%). The bus drivers were distributed as follows: urban transport passengers (38.8%), regular intercity-route passengers (31.1%) and chartered bus passengers (30.1%). The mean age of the sample was 40.44 years ($SD=11.78$). The mean distance between their place of work and their place of residence was 14.12 km ($SD=50.2$). Mean seniority in their occupation was 10.51 years ($SD=10.41$). The mean number of hours of work per week was 48 ($SD=22.91$).

Instruments

The Bus Drivers' Job Demands Scale (BDJD-24; Meijman & Kompier, 1998) allows us to evaluate the psychosocial demands of a bus driver's job. This measure was adapted in keeping with the proposals by various authors on adapting assessment measures (Beaton, Bombardier, Guillemin, & Bosi-Ferraz, 2000; Hambleton, 1994; Hambleton, Merenda, & Spielberger, 2005; Muñoz & Bartram, 2007; Hunt et al., 1991). First, the items were translated from English into Spanish by expert researchers (e.g., university professors) and practitioners (e.g., hazard prevention professionals) in the field. We consulted six experts. The items were then translated back from Spanish into English (back-translation) by other expert translators and the equivalence of the two versions (Brislin, 1970) was then checked. There were no disagreements concerning the back-translation of the items. The English version is made up of three subscales and features 24 items. The first and second have 9 items, which have to do with Time Demands ($\alpha=.82$) and Safety ($\alpha=.79$); and the third is Passengers and has 6 items ($\alpha=.84$). The response anchor was a 7 point scale (1= *Completely disagree*; 7 = *Completely agree*).

The transport scale (TRANS-18; Boada-Grau et al., 2012) allows us to detect safe behaviours (personal and in the vehicle) and psychophysiological disorders in professional drivers. It has 3 subscales, each of which is made up of 6 items. The factors are as follows: 1. Psychophysiological disorders ($\alpha=.81$; for example, Item 14: "My job has caused me some type of muscular and/or skeletal disorder (e.g., lower back pain, tendinitis, etc.)"); 2. Personal safety behaviours ($\alpha=.80$; for example, "Item 10: "I avoid driving after a heavy meal"); and 3. Safety in the vehicle behaviours ($\alpha=.70$; for example, Item 9: "I pay attention when I

get out of the vehicle"). The response format is a five-point scale (1= *never*, 2= *almost never*, 3= *sometimes*, 4= *almost always*, and 5= *always*).

The General Health Questionnaire (GHQ-12; Goldberg, 1972, 1978), in its Spanish version (Sánchez-López & Dresch, 2008), can be used to effectively assess psychological wellbeing and mental health. It features 3 subscales and 12 items. The factors are: 1. Coping with problems ($\alpha=.82$; 6 items; for example, Item 1: "Were you able to concentrate well on what you were doing?"); 2. Self-esteem ($\alpha=.70$; 4 items; for example, Item 6: "Have you had the sensation that you cannot cope with difficulties?"); and 3. Stress ($\alpha=.78$; 3 items; for example, Item 5: "Have you ever felt constantly overwhelmed and stressed out?"). The scale indicates that Item 9 ("Have you felt unhappy or depressed?") loads on two factors, positively on Factor-2 and negatively on Factor-3. The items are coded by means of four response options whereby higher scores indicate a poorer state of health and lower scores indicate greater psychological wellbeing.

Some correlates (Del-Líbano, Llorens, Salanova, & Schaufeli, 2010), also known as external indicators (Gimeno, Benavides, Mira, Martínez, & Benach, 2004), were used to evaluate convergent validity.

Procedure

In all cases, the tests were administered in the bus drivers' workplace. They took part voluntarily and with prior consent from their bosses from the companies taking part. This test was administered in a customised fashion by a Graduate in Psychology with prior expertise who was there during the administration of the tests to answer any queries that participants might have. The data facilitated by the bus drivers was treated as strictly confidential. Non-probabilistic sampling was used (Hernández, Fernández, & Baptista, 2000), also known as random accidental sampling (Kerlinger, 2001). The response rate of participants was 81%.

Data analysis

To begin with, the exploratory factor analysis was carried out using the principal axis factoring extraction method and applying Promin rotation. This was done in order to clarify the structure of the factors extracted from the scale. Following this, polychoric correlation matrixes were used, given that these are specially suited in cases where items present a Likert-type response format (Muthen & Kaplan, 1992). FACTOR 7.2 programme (Lorenzo-Seva & Ferrando, 2006) was used to carry out the parallel analysis (promin rotation), which is not available in the SPSS. We then calculated reliability using Cronbach's alpha for each of the three factors that were extracted. The validity matrixes were obtained by correlating the three factors of the BDJD-24 scale with the external correlates: the GHQ-12 and the TRANS-18. And, finally, the data analysis was carried out using the SPSS 19.0 and FACTOR 7.2 programmes.

Results

An exploratory factor analysis was performed, and the Kaiser-Meyer-Olkin (KMO) sample appropriateness index was .75, showing that the data were suitable for applying a factor analysis. The scree-test (Cattell, 1966) recommended a three-factor solution.

Two more techniques were applied to determine the number of factors that would be obtained, as well as Velicer's (1976)

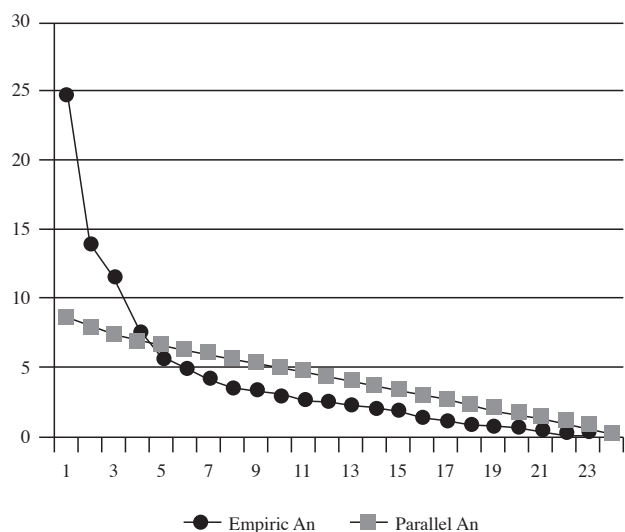


Figure 1. Sedimentation graph and parallel analysis of the Bus Drivers' Job Demands scale (BDJD-24)

“minimum average partial” criterion and parallel analysis (Lattin, Carroll, & Green, 2003). Both criteria pointed to the suitability of the three factor solution. Figure 1 shows the sedimentation graph along with the parallel analysis indicating the three-factor solution.

Once the most appropriate factor solution was determined, the Promin rotation method (Lorenzo-Seva, 1999) was used to obtain a simple factor solution. This oblique rotation method tends to obtain as simple a solution as possible even in those cases where some of the items display a complex structure. The 24 items of the adapted scale did not present saturations below .40 nor were these complex (above .40 in more than one factor). Thus, 24 items were kept from the original English scale (Table 1), which all together account for 50.4% of the variance.

As we can see in Table 1, the saturation matrix for the obtained factor solution enabled us to identify the contents of the three factor items, which were what we had expected. Moderate correlations were found among the factors, between -.01 and .26. These correlations are displayed in Table 2.

Table 2 shows the means, standard deviations, reliability coefficients and confidence intervals as well as the correlations among the three factors of the Bus Drivers' Job Demands scale. It also shows the correlations between the three subscales of the adapted scale and some correlates, the GHQ-12 and the TRANS-

Table 1
Saturation matrix of factors of the Bus Drivers' Job Demands (BDJD-24) Scale

Items	F1	F2	F3
A1. Cuando voy más rápido para recuperar tiempo, los pasajeros se zarandean por el autobús [If I try to make up for lost time, passengers swing around the bus]	.40	.19	-.05
A2. Como conductor tengo la sensación de que tengo que cumplir los horarios a toda costa [As a driver I feel that I have to run on time at all expense]	.55	.02	.19
A3. Cuando voy retrasado, empiezo a ir más rápido [If I am behind schedule, I start to rush along]	.55	.29	.03
A4. A veces meuerzo demasiado para cumplir los horarios [In order to drive on time, I sometimes force myself]	.77	-.01	-.10
A5. Me siento muy forzado a cumplir los horarios [I feel strongly compelled to run on time]	.62	.11	-.01
A6. Cuando voy unos minutos retrasado, siento la necesidad de recuperar tiempo como sea [If I am a few minutes late, I want to catch up one way or another]	.81	.06	-.15
A7. Me da absolutamente igual ir con retraso [It leaves me cold to be behind schedule] (R)	-.51	.28	-.14
A8. Cuando voy con retraso, empiezo a aumentar el ritmo [If I am too late, I start pacing up]	.58	.13	-.12
A9. Como conductor hago todo lo posible por salir y llegar a la hora [As a driver I do anything to depart and to arrive on time]	.43	-.22	.07
B1. A menudo acelero para pasar con el semáforo en ámbar [I often speed up to go through a yellow light]	.07	.65	-.01
B2. Fuera del casco urbano, a menudo sobrepaso los límites de velocidad [In the suburbs, I regularly exceed the speed limits]	-.03	.66	.19
B3. A veces me salto las reglas de preferencia para ahorrar tiempo [I sometimes just take the right of way, otherwise it takes too long]	.09	.76	.01
B4. Siempre respeto las reglas de tráfico [I always stick to the traffic rules] (R)	.24	-.50	.13
B5. A veces apuro tanto, que después me doy cuenta de que “me la había jugado” [I sometimes push it that far, that I realize myself afterward: “That was a narrow escape]	.29	.63	.13
B6. Cuando tengo prisa, me aproximo a los pasos cebra a tal velocidad que los peatones prefieren esperar [If I am in a hurry, I run into a zebra [pedestrian] crossing at such a high speed, that pedestrians rather keep waiting]	-.01	.71	-.01
B7. A veces, me meto descaradamente en un cruce para que me cedan el paso [I sometimes insolently run into a crossing in order to be given the right of way]	.15	.67	.04
B8. Por lo general, me aproximo a los cruces a gran velocidad, ya que así es más fácil que me cedan el paso [I regularly approach a crossing at high speed, because then I'm easier given the right of way]	.06	.71	-.10
B9. Siempre estoy muy atento por motivos de seguridad [For safety reasons, I am constantly paying attention] (R)	.27	-.44	.00
C1. Me gusta cuando alguien se pone a mi lado y me da conversación [I always enjoy it, when someone joins me and makes a chat]	-.08	.13	.67
C2. Considero que el trato con los pasajeros es la parte más importante de mi trabajo [Dealing with passengers I consider the most important part of my work]	.14	-.01	.70
C3. El trabajo sale mejor cuando los pasajeros no me hablan [Work is more convenient when passengers keep silent] (R)	.22	-.19	-.54
C4. Para mí, lo más importante es tener una buena relación con los pasajeros [The most important thing is that I have a good relationship with passengers]	.22	-.07	.59
C5. Preferiría estar separado de ellos para no tener que hablar [I would prefer to sit divided off passengers, no talking to them] (R)	.19	-.07	-.63
C6. El contacto con los pasajeros hace más agradable mi trabajo [Contact with passengers gives me pleasure in work]	-.02	-.13	.70
Variance (50.40%)	24.80	14.00	11.60
F1. Time Demands; F2. Safety; F3. Passengers (R) reverted items			

Table 2

Descriptive Statistics, Reliability, Confidence Intervals, Correlations among the Three Factors of the Bus Drivers' Job Demands scale (BDJD-24) themselves, and with some Correlates and the Factors of the GHQ-12 y TRANS-18 Scales

	F1 Time demands	F2 Safety	F3 Passengers
Means	42.46	20.86	28.79
SD	10.29	10.17	6.91
Reliability	.80	.84	.75
Confidence interval	.77-.83	.81-.86	.70-.80
In the last week: Number of days you have felt tired and without energy over the last week	.19*	.18*	.02
On a normal work day: Number of passengers who use the bus when you are driving	.27*	-.01	-.19*
On a normal work day: Number of stops you make	.19*	.11	-.06
On a normal work day: Number of kilometres you do	-.05	-.21*	-.06
On a normal work day: Number of orders received from your supervisor	.08	.29**	-.03
In the last 12 months: Number of traffic accidents you have been involved in	.19*	.34**	-.16
In the last 12 months: Number of days you have gone in to work ill	.18*	.18*	.11
GHQ (Success in coping)	.08	.13	-.05
GHQ (Self-esteem)	.14	.33**	-.06
GHQ (Stress)	-.18*	-.19*	.07
TRANS (Psychophysiological disorders)	.06	.30**	-.16
TRANS (Personal safety behaviours)	-.06	-.19*	-.21*
TRANS (In the vehicle safety behaviours)	-.13	-.23**	-.18*
Time demands	-	-	-
Safety	.26	-	-
Passengers	-.01	.06	-

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

18. The resulting scale reliability and factor structure indicate that the measure is appropriate and that the three obtained factors are clearly differentiated from each other

It also features the correlations between the measure we presented and two scales (GHQ-12 and the TRANS-18) as well as external correlates, which enable us to inform on validity indices. We can thus observe correlations between the three factors of the scale we analysed, on the one hand, and the measures as well as external correlates, on the other. Hence, the factor that expresses Schedule Demands (F1) correlates negatively with stress (GHQ-12) and positively with five correlates (e.g., the days the driver has felt tired and without energy over the last week). Furthermore, Safety (F2) associates negatively with GHQ-12 (stress), with TRANS-18 (personal and in the vehicle safety behaviours) and with the number of kilometres behind the wheel. It associates positively with six external correlates (for example, the days the driver has gone into work ill in the last twelve months) with self-esteem (GHQ-12) and with psychophysiological disorders (TRANS-18). And, finally, Passengers (F3) correlates negatively with TRANS-18 (personal and in the vehicle safety behaviours) and with the number of passengers who use the bus when the driver is on the job.

Conclusions

The findings of the present study have enabled us to outline its psychometric properties. They support the factor structure, internal consistency and validity for evaluating the job demands of bus drivers of the BDJD-24 scale. Furthermore, this is the first time that the scale has been presented adapted into Spanish. Our first objective was to empirically check the internal structure. The

results of the exploratory factor analysis support Meijman and Kompier's three-factor model (1998). It is worth pointing out that the three factors of the Spanish version are made up of the same items as the English version.

The first factor, Time Demands, is related with the schedule demands of driving such as driving fast in order to catch up when running late, leaving and arriving on time, and feeling forced to keep to timetables. It is the factor with the most variance, accounting for 24.80% of variance, and is made up of nine items (from A1 to A9). The second factor, Safety, has to do with safety factors behind the wheel such as accelerating to go through yellow traffic lights, exceeding the speed limit, not giving right of way, and driving into a crossroad so that other vehicles will give way. It is made up of nine items (from B1 to B9), which account for 14.00% of variance. The last factor, Passengers, has to do with the interaction between the driver and the users of the bus service. This factor refers to aspects such as entering into conversation with passengers, treating them appropriately and getting on well with them. It accounts for 11.60% of variance and is made up of six items (from C1 to C6). The correlations between the three factors in the Spanish version we presented are as follows: F1-F2 ($r = .26$), F1-F3 ($r = -.01$) and F2-F3 ($r = .06$). They are quite different from those found by Meijman and Kompier (1998): F1-F2 ($r = -.45$), F1-F3 ($r = -.08$) and F2-F3 ($r = .09$).

Our second objective was to analyse reliability, which was confirmed, given that the reliability coefficients are appropriate. In the Spanish version, the reliability indices for the three factors range from .75 to .84, practically the same as those for the original version (.79 to .84). As regards validity, the data obtained from this study found a significant association between the three factors

of the scale we analysed and other scales, which means that the third objective has been met. Our stress, assessed using the GHQ-12, is associated both with Time Demands factor ($r = -.18, p < .05$) and with Safety ($r = -.19, p < .05$). These correlations are similar to those found by Meijman and Kompier (1998). Furthermore, the Safety factor is associated with self-esteem ($r = .33, p < .01$), with psychophysiological disorders ($r = .30, p < .01$), and with personal safety ($r = -.19, p < .05$) and safety in the vehicle behaviours ($r = -.23, p < .01$). The Passengers factor correlates negatively with personal safety ($r = -.21, p < .05$) and safety in the vehicle ($r = -.18, p < .05$).

The third objective was to find indications of validity. On the whole, the results of the study found a significant association between the three factors of the scale we analysed and those of other scales and external correlates. Although Meijman and Kompier (1998) did not use external correlates to determine the validity of the BDJD-24 scale, we decided to incorporate some of these in our research study and found significant correlations with some of these: fatigue (with Time Demands, $r = .19, p < .05$ and with Safety, $r = .18, p < .05$), the number of passengers being transported (with Time Demands, $r = .27, p < .05$ and with Passengers, $r = -.19, p < .05$), the stops made during the service (with Time Demands, $r = .19, p < .05$), kilometres covered during a working day (with Safety, $r = -.21, p < .05$), orders received from an immediate superior (with Safety, $r = .29, p < .01$), accidents the driver has been in (with Time Demands, $r = .19, p < .05$ and with Safety, $r = .34, p < .01$) and the days the driver has gone in to work ill (with Time Demands, $r = .18, p < .05$ and with Safety, $r = .18, p < .05$).

In conclusion, taking into account the findings of this research, the Spanish version of the BDJD-24 scale can be a useful measure for evaluating the job demands of bus drivers. Furthermore, this measure is brief, easy to understand and quick to apply and to interpret using the three subscales that it is made up of.

As regards the applicability of the Bus Drivers' Job Demands scale (BDJD-24), it can be used to introduce prevention programmes (Evans & Johansson, 1998; Machin & Hoare, 2008;

Tse, Flin, & Mearns, 2007) as well as to set up health hazard prevention programmes (Boix, Benavides, Soriano, Moreno, Roe, & García-Gómez, 2000) by gathering, analysing and systematically interpreting data concerning workers' occupational health in order to safeguard their health and prevent illnesses. In this way, it can enable us to safeguard the occupational health of professional drivers and to avoid possible occupational hazards (Thacker & Berkelman, 1992). Furthermore, it facilitates decision making in preventative healthcare backed by contrasted scientific tests that meet basic psychometric criteria (Boada-Grau, González, Vigil-Colet, Mañas, & Agulló, 2009; Spencer, Robertson, & Folkard, 2006). These can, in turn, lead to psychosocial initiatives such as Employee Help Programmes (Solé & Balduque, 2006) that can provide valuable information to prevent both existing and future high occupational hazards.

The limitations of the present study will give rise to research initiatives we intend to carry out in the future. We shall now go on to comment on these. To begin with, the internal structure needs to be corroborated by means of a confirmatory factor analysis with a new sample. Similarly, the functioning of the subscales and items needs to be studied in different collectives of bus drivers, for example, drivers of different national and cultural backgrounds whose presence in this sector in Spain is on the increase. Secondly, the validation of a scale is a dynamic process that does not end with its construction and publication (Padilla, Gómez, Hidalgo, & Muñiz, 2006). Therefore, new research efforts are likely to contribute new data on this scale. Thirdly, it would be a good idea to look into whether the proposed scale addresses critical issues in the transport industry, such as the lack of motivation for occupational safety, shift work, night shifts and a long list of other matters. And fourthly, we consider that it would be very much worthwhile to examine whether certain basic personality traits such as impulsiveness, daringness, minute attention to detail, responsibility, locus of control, etc. might be modulating variables of Time Demands, Safety and Passengers.

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