FACTORIAL STRUCTURE AND INTERNAL CONSISTENCY OF
THE UTRECHT WORK ENGAGEMENT SCALE (UWES) 17
AMONG HEALTH WORKERS OF CHILE

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ABSTRACT

In order to provide evidence of validity and reliability of the instruments to evaluate the quality of working life, this study assesses the factorial structure and the reliability of the UWES-17 scale, measuring Engagement or employment commitment. A group of 165 Chilean Health workers were surveyed from various health disciplines and contract quality, the majority being women (70.30%) and non-medical professionals (27.88%). Through a Factorial Exploratory Analysis, we identified two factors: involvement with work and enthusiasm for work, demonstrating sufficient reliability. The study shows that the UWES-17 scale, considering the factorial structure referred to above, presents appropriate psychometric properties to be used in Chilean health workers, which supports its use to investigate this laboral phenomenon.

Key words: Engagement work, reliability, health workers, factor analysis
The quality of working life from the *Burnout*

The quality of working life points to the level of satisfaction, motivation, commitment and involvement that people experience around their job. A conducive working environment contributes to a high quality of work life, this translates into better performance and a higher level of overall satisfaction, first individually and then organizational (Pavithra & Barani, 2012).

Within the health professionals, this phenomenon has been called a growing interest, considering that it affects the well-being and health of workers as well as the service they provide to the Community (Extremera, Duran & Rey, 2005; Gil-Monte, 2002). And in this context, the study of *Burnout* has acquired a special importance (Gil-Monte, 2002).

*Burnout* is a disorder arising from labor exercise, manifesting itself through a growing sense of emotional exhaustion, cynicism, negative attitudes towards people with a negative assessment of itself and work performance (Maslach & Jackson, 1981). These features are organized by Maslach in three dimensions: emotional exhaustion, depersonalization, and lack of personal fulfillment, which are collected by the inventory of *Burnout* by the same author: the MBI or *Maslach Burnout Inventory* (Maslach & Jackson, 1981). This is the instrument of auto-report most widely used to assess the phenomenon (Aguayo, Vargas, de la Fuente & Lozano, 2011).

Originally, the *Burnout* was seen as an inadequate response to interpersonal chronic stressors which occurred in professions involving serving people (Aguayo et al., 2011; Carlotto & Camara, 2007; Salanova, Schaufeli, Llorens, Peiro & Grau, 2000) and was associated with the emotional load and the frustrations of work taking place in social interaction (Gil-Monte & Olivares, 2011).

Today the concept has expanded, so that it refers to a job crisis in broad terms, the result of the weight of the work itself and not the relationship with other people (Martinez & Marques, 2005; Pacheco, Duran & Rey, 2007). However, the history of the *Burnout* was born in professions who work with people (Salanova et al., 2000), and among these, health professionals are the group in which the phenomenon has been most studied (Roman, 2003). This explains why the health professionals work in a context conducive to the appearance of the picture, as they constantly face the suffering of patients and their families, to the death and the frustration of not being able to cure. In addition, their work usually develops in individualistic and bureaucratic institutions, tend to have irregular hours, they attend a high number of patients and their aid work demands a minimum of emotional involvement, for whose regulation they have not been trained (Rios & Lopez, 2004).

The increased risk of these professionals is evident in the results obtained in different countries. In the United States, health professionals have a higher average of *Burnout* among different professions (Roman, 2003). Similarly, in a study conducted in the primary health care in Spain, it was also found that more than 30% of respondents reported high emotional exhaustion and high depersonalization, while nearly a quarter of the respondents reported an acute lack of personal fulfillment (Caballero, Bermejo, Nieto & Caballero, 2001). Similar results obtained Roman (2003) in doctors and Cuban nurses working in primary and secondary care.

The importance of the study of *Burnout* is the harmful consequences for the individual and the organization. The consequences on an individual level include physical, behavioral, social and familiar alterations, which could result in an increase in the consumption of medications, drugs and alcohol (Atance, 1997). At working level, in itself implies a negative attitude towards the people with whom we work (Rios & Lopez, 2004) and will be linked to a lower efficiency of the subjects and a higher absenteeism (Atance, 1997).

The quality of working life from a positive standpoint: the *Engagement*

Multiple studies seeking to understand the quality of working life, particularly in the health sciences have been developed based on the concept of *Burnout* (e.g Caballero et al., 2001; Ibañez, Vilaregut & Abio, 2004; Roman, 2003; Wilczek-Ruzyczka, 2011). However, this investigative line insists in the classic psychological perspective focused on the problems of mental health (Bakker, Schaufeli, Leiter & Taris, 2008). Currently it intends to study the quality of life from the viewpoint of positive psychology, focused on the strengths and protective factors (Bakker et al., 2008). At the organizational level, this rests on the conviction that...
happiness, or labor welfare in general, produces success (Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2009), with evidence that a higher quality of working life is associated with better performance and also to a greater desire to remain on the job (Pavithra & Barani, 2012).

The necessity of approaching labor welfare from positive psychology has led to changing the focus from the Burnout to Engagement. The labor Engagement or commitment to work is the conceptual opposite of Burnout and is characterized by a positive and persistent affective-motivational state of well-being associated with work (Bakker et al., 2008; Schaufeli, Salanova, Gonzalez-Roman & Bakker, 2002b). In this line, Maslach and Leiter (cited in Schaufeli et al., 2002b) suggested an operationalization of this construct that would include three dimensions: vigor, dedication and absorption, opposite in turn to the three dimensions of Burnout that classically have been identified in the model of Maslach (Salanova et al., 2000; Schaufeli et al., 2002b).

As with the Burnout, the relevance of the work Engagement, it also derives from its associated consequences. But unlike the hundreds of studies that have been generated with its conceptual opposite, the study of this construct is just beginning (Bakker et al., 2008), already relations of the Engagement have been identified with a better physical and mental health, higher intrinsic motivation, auto-efficiency, optimism and self-esteem in the Organization (Sappala et al., 2009; Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2008; Xanthopoulou et al., 2009). At work, a greater Engagement is also associated to a better work performance, greater job satisfaction, organizational commitment (Nerstad, Richardsen & Martinussen, 2010; Sappala et al., 2009) and a higher production, since it positively affects the performance of the working team (Xanthopoulou et al., 2009). In addition, more engaged subjects occupationally show to be better able to support their colleagues, receive feedback and create job opportunities, adapting successfully to their work environments since they can recognize, activate and generate labor resources more easily (Xanthopoulou et al., 2008).

The measurement of the Engagement

Originally, Maslach and Leiter (cited in Schaufeli et al., 2002b) proposed to measure the Engagement by interpreting it as the opposite of scores of the MBI, so that high scores in emotional exhaustion, depersonalization, and lack of personal development, can be interpreted as low levels of force, dedication and absorption.

However, other authors consider that both phenomena, though similar, have different patterns of causes and consequences, playing different mediating roles in the work environments (Shimazu et al., 2008). From this perspective, Schaufeli’s team constructed a questionnaire of auto-report, the Utrecht Work Engagement Scale, UWES, in which the Engagement is operationalized as a phenomenon in itself contrary to but different from Burnout (Nerstad et al., 2010; Schaufeli et al., 2002b).

In a mid-term perspective, the inventory of Burnout of Oldenburg, was designed to evaluate Burnout, but had conversely phrased items so it could use both to assess Engagement as well as Burnout (Bakker et al., 2008). However, the UWES is the instrument most used to measure Engagement (Bakker et al., 2008), and is at the same time the one having more studies on their worldwide psychometric properties.

Although the original proposal of the UWES had 24 items, 7 defective reagents were eliminated, and it was finally made up of 17 items (UWES-17) (Schaufeli et al., 2002b). They would address the three above-mentioned dimensions of the construct: force, dedication and absorption (Nerstad et al., 2010).

According to its authors, the original study of the instrument of Schaufeli et al. (2002b) found empirical support for this trifactorial structure in Spain, between workers and students (with the latter a slightly phrased version is dealt to evaluate academic Engagement). However, the data that they themselves published do not support such a conclusion since the indicators of goodness of the adjustment to the trifactorial structure, although they are better than those found for the structures of one or two factors, threw a statistical GFI (Goodness of Fit Index) of 0.91 and a (Comparative Fit Index) CFI of 0.90. On the other hand, RMSEA (Root Mean Square Error of Approximation) of the three factor model was 0.06. The three statistics show that the trifactorial structure would not be a good fit, but that this would hardly be acceptable (Martinez, Hernandez & Hernandez, 2006).
Other studies have also shown a better performance of the three factors structure above the univariate and bivariate alternatives, although there is no conclusive evidence of a good fit of the same. Thus, in Norwegian workers it was obtained a CFI of 0.97 which showed a good fit, but not the RMSEA, which was 0.07 (Nerstad et al., 2010). On the other hand, a study with students from Portugal, Spain and Netherlands showed a good fit of the instrument in the total sample and by groups, with CFI and TLI statistics of about 0.95 and RMSEA Statistics under 0.05, (Schaufeli, Martinez, Marques-Pinto, Salanova & Bakker, 2002a), which would be minimum thresholds to define a good fit (Martinez et al., 2006). In this study the Spanish version performed better compared to the Portuguese and the Dutch. However, on this occasion the UWES 17-S was used, which measured academic, non-working Engagement (Schaufeli et al., 2002a).

In the same line, problems have also been found to replicate the structure of three factors in Japanese and German workers, where a one-dimensional structure has shown a better fit through Confirmatory Analysis Factor (Sonnetag, 2003, cited in Nerstad et al., 2010; Shimazu et al., 2008).

In terms of criterion validity, the instrument has shown negative correlations, statistically significant, with scores of the MBI, reaching correlation coefficients between $r = -0.30$ and $r = -0.65$, which is concordant with the theory, where is hypothesized an inverse relationship between both constructs. Also, a recent study showed Engagement performed an evaluation of a different kind of labor welfare to both Burnout and addiction by work (Workaholism) (Schaufeli, Taris & van Rhenen, 2008).

A shorter version of the UWES was developed by the same team of Schaufeli later, and is composed of three items of each factor of the original instrument (Schaufeli, Bakker & Salanova, 2006). The UWES-9, as it has been termed, has shown a high correlation with the version of 17 items and a negative correlation with the MBI (Nerstad et al., 2010). In terms of its internal dimensionality, it has presented the same trifactorial structure in different countries of Europe, and in Canada and South Africa (Nerstad et al., 2010; Schaufeli et al., 2006). Even the version of nine items showed a better fit to the trifactorial structure in Chinese workers from Hong Kong (Chun-tat & Ng, 2011) and Norwegian workers (Nerstad et al., 2010), with greater stability among samples and over time in a longitudinal study of Finnish workers (Sappala et al., 2009).

In Chile, on the other hand, the trifactorial structure has not been able to be replicated in any of the two versions of the instrument. In the case of the UWES-9, Parra and Perez (2010) identified a structure of two factors in a study conducted with psychology students. Subsequently they identified a similar bivariate structure in a sample of University students of different races by applying the version of 17 items (Parra, Fasce, Perez, Ortiz & Parra, in review). However, in both studies the refrased version for students that assesses academic Engagement was applied, without encountering previous studies on Chilean workers.

The objective of this study

The characteristics of the work of health professionals expose them to physical and mental health problems, which include the Burnout, which influences not only their personal well-being, but also on the well-being of the communities with which they work. However, it is necessary to supplement the traditional lines of research on the quality of labor welfare of the health workers with a vision that does not focus only on the flaws (such as studies of Burnout), but on the strengths of the staff.

However, to enhance the research from this perspective—scarce, especially in Chile—it is needed to rely with local validity evidence tools with evidence which enable to assess constructs as the labor Engagement. Faced with this challenge, this research seeks to provide initial evidence on the validity of the UWES-17 in Chilean health workers, which is the extended version of the instrument proposed by Schaufeli’s team. It specifically seeks to provide background information on factorial structure and internal consistency present in this population. The first, since factorial structure provides evidence of validity associated with the construct, assessing the coherence between the theoretically expected behavior and its empirical behavior. The second, given that the internal consistency allows to estimate the degree of accuracy of the measurement, evaluating at what level this is affected by the items that it has decided to include in the instrument, i.e., the sampling of contents (Martinez et al., 2006).
Method

Participants

171 workers which were surveyed worked in a center of family health (CESFAM) of Concepcion, Chile, providing primary and secondary care. A valid 165 sample was extracted after discarding replies omitted in the evaluated instrument, of which 116 (70.30%) corresponded to females and 35 (21.21%) to males; there were 14 cases which did not deliver this information. Their ages were between 23 and 68 years, with an average of 39.61 years (DE = 11.23).

Respondents were between 0 and 48 years old, working in the area of health (M = 14.08; (DE = 10.83), and from 0 to 44 years working in the same CESFAM (M = 9.72; (DE = 9.39). The majority group belonged to the professional establishment, according to the law 18.834 (n = 46; 27.88%); followed by technical staff (n = 44; 26.67%), and medical professionals, according to the Law 19.666 (n = 30; 18.18%). The study also included administrative staff (n = 22; 13.33%) and auxiliaries (n = 10; 6.06%), with 13 cases that did not give this information.

Instruments

The rated instrument is the translation into Spanish of the Utrecht Work Engagement Scale (Utrecht work Engagement scale). This translation corresponds to a modification that Parra et al. (in review) made the Spanish version proposed by the team of Schaufeli (Schaufeli et al., 2002b) to improve its understanding in the Chilean population, of which it was specifically used the version of 17 items. According to Schaufeli et al. (2002b), the items are taxed at a trifactorial structure, measuring three dimensions: force, absorption, and dedication. The score ranges from 0 to 6 between «no time» and «every day».

Analysis of the data

For the evaluation of the factorial structure of the instrument an Exploratory Factor Analysis was carried out, applying the main shaft method of extraction, with oblique Oblimin rotation. It was decided to carry out an Exploratory Factor Analysis since there is inconsistent evidence about the number of dimensions in which the instrument is organized.

Internal consistency is evaluated using the Cronbach’s reliability alpha coefficient.

Statistical analyses were performed with the statistical package STATA SE 11.0

Results

Evaluation of the structure factor of the UWES

Given that Schaufeli et al. (2002b) proposes a trifactorial structure for the instrument, but studies previously made in Chile with the academic UWES (Parra & Perez, 2010; Parra et al., in review) have identified a fairly consistent bivariate structure, it was decided to perform an Exploratory Factor Analysis (whose acronym in English are EFA) for seventeen UWES scale items.

The Exploratory Factor Analysis was performed using the extraction method of the Main Shaft Analysis, AEP, which would be the most suitable for the evaluation of scales composed like this (Hair, Black, Babin, Anderson & Tatham, 2005; Tabachnick & Fidel, 2006).

Before carrying out the EFA, it was assessed if it was right to do it with the collected data. With this aim, the statistic of sampling adequacy of Kaiser-Meyer-Olkin (KMO) and Bartlett’s sphericity test was calculated. The statistical KMO turned out to be equal to 0.82, while Barlett’s test was statistically significant $\chi^2$(136) = 1258.45; $p < 0.001$. In this way, the two criteria supported the adequacy of factorial analysis.

As the next step it was proceeded to identify the number of factors, which were used in three criteria. First we used the criteria most commonly used in the literature: 1) the criterion of Kaiser-Guttman or latent root and 2) the contrast of fall criteria (Hair et al., 2005). However, given the criticism they have received (Buja & Eyuboglu, 1992), it was decided to supplement them with a most appropriate technique for this purpose: 3) the Parallel Analysis of Horn.

According to the first criterion, Kaiser-Guttman or latent root (Hair et al., 2005) two factors with their own values (eigenvalues) greater than 1.0, being these eigenvalues of 6.87 and 1.56 that would explain a 79.06% of the total variance of the items.
The second criterion, of contrast of fall, through the graph of sedimentation or *Scree plot* coincided with the bivariate solution, Figure 1.

![Graph of sedimentation for the UWES-17 work Engagement scale](image)

**Figure 1.** Graph of sedimentation for the UWES-17 work Engagement scale

And finally, the Parallel Analysis of Horn on the basis of 5,000 random samples, coincided with the existence of two factors with eigenvalues (6.87 and 1.56) above the own values presented by 95% of random samples (0.83 and 0.73).

Considering that the three criteria agreed in the settlement of two factors, it was proceeded to assess the organization of the items within this bivariate structure, calculating coefficients of configuration for each item in each factor, using AEP applying Oblimin’s oblique rotation, Table 1.

### Tabla 1
**Array configuration of the labor Engagement UWES-17 scale obtained through Main Shaft Analysis with Oblimin rotation**

<table>
<thead>
<tr>
<th></th>
<th>I</th>
<th>II</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>In my job, I feel full of energy.</td>
<td>-0.057</td>
</tr>
<tr>
<td>2</td>
<td>My work has meaning and purpose for me.</td>
<td>0.736</td>
</tr>
<tr>
<td>3</td>
<td>Time flies when I’m working.</td>
<td>0.144</td>
</tr>
<tr>
<td>4</td>
<td>I feel with energy in my work.</td>
<td>-0.058</td>
</tr>
<tr>
<td>5</td>
<td>I am excited about my work.</td>
<td>0.572</td>
</tr>
<tr>
<td>6</td>
<td>When I am working I forget everything that happens around me.</td>
<td>0.041</td>
</tr>
<tr>
<td>7</td>
<td>My work inspires me.</td>
<td>0.680</td>
</tr>
<tr>
<td>8</td>
<td>When I wake up in the morning I want to go to work.</td>
<td>0.466</td>
</tr>
<tr>
<td>9</td>
<td>I am happy when I am focused on my job.</td>
<td>0.740</td>
</tr>
<tr>
<td>10</td>
<td>I am proud of the work I do.</td>
<td>0.679</td>
</tr>
<tr>
<td>11</td>
<td>I am involved with my work.</td>
<td>0.887</td>
</tr>
<tr>
<td>12</td>
<td>I can continue working for long periods of time.</td>
<td>0.719</td>
</tr>
<tr>
<td>13</td>
<td>My job is a challenge for me.</td>
<td>0.723</td>
</tr>
<tr>
<td>14</td>
<td>I get «carried away» by my work.</td>
<td>0.515</td>
</tr>
<tr>
<td>15</td>
<td>I am very persistent in my work.</td>
<td>0.752</td>
</tr>
<tr>
<td>16</td>
<td>It is difficult to «disconnect me» of my work.</td>
<td>0.301</td>
</tr>
<tr>
<td>17</td>
<td>I continue working even with difficulties.</td>
<td>0.630</td>
</tr>
</tbody>
</table>

Note: The figures highlighted in **bold** indicate loads higher than 0.30
The 17 items of the scale presented at least one coefficient of configuration about 0.30, which is the minimum value suggested as a threshold to accept a factorial charge as adequate (Hair et al., 2005), although the items 5 and 8 presented two factorial charges above said threshold (crossed charges). In these cases, it was carried out an analysis of the conceptual coherence of the factors and the relevance of these items. As a result of this analysis, it was decided to assign the items to those factors where its higher factorial charges were presented since these also presented a conceptual consistency.

Thus, factors were configured as follows:

- **Factor I**: composed of items 11, 15, 9, 2, 13, 12, 7, 10, 17, 5, 14, 8, and 16 (ordered from greatest to least-charged), including the five items of the factor that Schaufeli et al. (2002b) called Dedication, four of the Absorption factor and three Vigor factor. Despite this, it was decided to call the Involvement with the work factor, since the set of items would allude to the level of effort that the subject devotes to work together with the positive emotions that this produces.

- **Factor II**: Consisting of the items 1, 4, 3 and 6, it considered two items of the original Vigor factor and two original Absorption factor. Denominated Enthusiasm for work, since their items refer to the level of energy and pleasure that produces the work activity.

### Reliability of the scales

To evaluate the internal consistency of these two factors Cronbach’s Alpha Coefficient of Reliability was used. This was of $0.87$ for Involvement with the work factor, with correlations between the items and the corrected total of $r = 0.35$ (item 16) to $r = 0.76$ (item 15), and 0.59 for the Enthusiasm for work factor, with correlations between the items and the corrected total of $r = 0.26$ (item 6) $r = 0.57$ (item 1). Finally, the scale as a whole, evaluating Engagement in a global way, presented a Cronbach’s coefficient of 0.87, with correlations between the items and the corrected total of $r = 0.21$ (item 6) $r = 0.80$ (item 9).

Given that the reliabilities were enough to use a general scale and scores on both factors, we calculated their score by the sum of the coded responses of each subject and evaluated the correlation between them using the Pearson coefficient. The results show a correlation of moderate intensity between both factors, $r (163) = 0.56; p < 0.001$, Table 2.

### Discussion

By analyzing the factorial structure of the UWES-17 scale, two factors were identified, which brands differences with the original proposal of the authors (Schaufeli et al., 2002b), however, it was expected given the inconsistent results in different European populations, including Spanish speaking population (Nerstad et al., 2010) Schaufeli et al., 2002a). It was also expected in light of the problems that there’s been to replicate the trifactorial model in other countries, such as Germany and Japan (Sonnetag, 2003, cited in Nerstad et al., 2010; Shimazu et al., 2008).

On the contrary, the results obtained are consistent with previous studies carried out in Chile with the academic version of the UWES-17 and UWES-9 where structures of two factors were found (Parra & Perez, 2010; Parra et al., in review). This would point that in the Chilean reality there are only two large dimensions of the Engagement: the first, referring to the degree of involvement of the subject with the task, which Parra and his collaborators have called Involvement in studies in the application of the UWES-17 (Parra et al., in review) or Predisposition to study (Parra &
Perez, 2010) in the UWES-9, and the second, referred to the level of pleasure that the task produces, and these researchers called Satisfaction with studies or Academic satisfaction, respectively. Although these studies have been made with the version of the UWES for students, they are consistent with the present results, which show that absorption with the task and the force of this appear to merge in a single large dimension: the Involvement.

In terms of reliability, although the scale of Involvement with the work presented a proper reliability, in the case of factor Enthusiasm for work, the lower reliability, hardly suitable for the use of the scale, it can be attributed to fewer items in the same (4). However, three of the items present correlations with the corrected total of the factor greater than 0.30 ($r = 0.57, r = 0.44, and r = 0.36$) and the only one that has a lower correlation (item 6), presents a close coefficient to this threshold ($r = 0.26$), showing that although the scale has a low reliability, the items have an adequate discriminating capacity.

Finally, correlation with the size of the large effect between both factors, evidences that they are both independent, but closely related, as expected of two dimensions of a unique construct: the labor Engagement.

In this way, results show that the UWES - 17 presents psychometric properties suitable for use in Chilean health workers, considering the structure of two factors. However, given that its reliability is under 0.90, it is recommended only for purposes of research or organizational diagnosis, but not for other purposes, such as psychological evaluations or individual diagnoses (Martínez et al., 2006).

On the other hand, although the sample was disciplinary and contractually heterogeneous, it is recommended further study of the psychometric properties of the instrument with workers from different geographical areas, and later including the tertiary level of health. Similarly, given the conflicting evidence worldwide around the structure factor of the UWES, it is recommended to perform further studies with larger samples which allow performing a confirmatory factor analysis in Chile and assessing which of these structures is the more relevant (two or three factors, even one). The same would allow assessing whether effectively the fusion of force and absorption better reflects the kind of work commitment of the Chilean population.

References


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