



## Research article

## Development and validation of the Work Envy Appraisal Scale (WEAS) for Spanish workers

Pilar González-Navarro<sup>a</sup>, Lucia I. Llinares-Insa<sup>b,\*</sup>, Rosario Zurriaga-Lloréns<sup>a</sup><sup>a</sup> Research Institute of Personnel Psychology, Organizational Development and Quality of Working Life (IDOCAL), Universitat de València, Spain<sup>b</sup> Department of Social Psychology, Universitat de València, Spain

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## ABSTRACT

Envy is an important emotion that affects workers' behavior and performance. Instruments to measure envy are available, but new scales are needed for the analysis of work envy that include appraisals of challenge (benign envy) and threat (malicious envy). Based on Lazarus and Folkman's theory, the objective of this study is to develop and validate the Work Envy Appraisal Scale (WEAS) for Spanish workers. It had been carried out in two studies; in the first study, the scale was constructed and its dimensions were analyzed with a sample of 100 Spanish workers (sample 1). In the second study, the scale was validated and its psychometric properties were analyzed (sample 2, N = 219; sample 3, N = 532). The results of exploratory, confirmatory, and multigroup factor analysis showed good indices of fit for the two-factor structure. Moreover, the results showed adequate convergent and discriminant validity. Furthermore, our findings indicated that the scale is a reliable and valid instrument for measuring envy at work. This way of measuring envy at work (discerning its challenge and threat appraisal) makes it possible to find answers to some recurrent research questions (e.g. social desirability issues, the confusion of envy with other topics, etc.) and can facilitate reliable research on envy at work.

## 1. Introduction

In recent years in Spain, there have been transformations that have modified the labor context. In addition, the COVID-19 pandemic has generated an unprecedented social and economic crisis. In this context, the competition and comparison processes in the workplace are increasing, and envy is becoming more and more frequent. Interest in research on envy at work has grown considerably in recent years (see the review by [1–3]).

In the pioneering studies on this topic, envy at work was defined as a “pattern of thoughts, emotions, and behaviors formed in response to the attainment of one's strongly desired output by others” [4]. Later, other authors defined envy as the tendency to respond with negative feelings to another person's advantage [5]. As both definitions reveal, the underlying idea is that work envy is an unpleasant emotion that includes negative feelings because someone else enjoys or possesses something the envious person desires or covets [3,5–7].

However, more recent studies have pointed out that there are two qualitatively different types of envy: benign and malicious envy (see Refs. [8–15]). Malicious envy fits the traditional view of envy, whereas benign envy is characterized by the motivation to improve one's own position [16]. As [15] points out, the difference between the two types of envy is related to the thoughts, feelings, and action

\* Corresponding author.

E-mail addresses: [pilar.glez-navarro@uv.es](mailto:pilar.glez-navarro@uv.es) (P. González-Navarro), [lucia.llinares@uv.es](mailto:lucia.llinares@uv.es) (L.I. Llinares-Insa).<https://doi.org/10.1016/j.heliyon.2023.e13097>

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tendencies they provoke and their focus on different aspects of social comparison. People compare themselves to another person who is similar to them in an important domain [5]. As a result of this comparison, the person may be inclined to improve in order to be at the same level or a similar level to the envied person (benign envy), or he/she may initiate behaviors to bring the other person down [17]. Likewise, recent research has focused on the different effects of malicious versus benign envy (see Refs. [12–14]).

Based on this dual conceptualization of envy, several questionnaires have been developed that assess both benign envy and malicious envy. A large number of researchers have used the scale developed by Ref. [11] (see, [18–24]). This scale (BeMas) measures dispositional benign and malicious envy through comparison situations. It is composed of 10 items that measure both patterns of envy (five items each). Another scale to assess dispositional benign and malicious envy was developed by Ref. [16]. This scale considers the cognitive, affective, and motivational aspects of both types of envy in an organizational context. Five items were created to measure benign envy and four items to measure malicious envy. In addition to these scales, some authors have used other methods to assess both types of envy. In their research [25], sent participants a questionnaire where they had to indicate every night whether they had experienced envy that day. If they answered affirmatively, they had to open an envelope containing another questionnaire that asked them to describe their experience of envy and then answer a series of questions. All the questions began with the words “When I experienced envy”, followed by different items (for example: “It felt pleasant”, “I felt inspired by the person I envied”, “I tried harder to achieve my goals”, “I complimented the other for his or her success”, “It felt frustrating”, etc.). Other authors have used scenarios to elicit benign and malicious envy emotions (see Refs. [14,26]). Therefore, from this dual envy perspective, the differentiation of envy stems from the different action tendencies and outcomes [1].

The development of envy measures has allowed having reliable tools to assess envy and the types of envy. However, we agree with [1] that having too many envy measures can lead to inconsistencies in its measurement or even assess different experiences. Thus, one question is how we can know when a person feels envy, which leads us to ask about the emotion directly, that is, to ask people whether they feel envy in different situations. However, the literature on social desirability indicates that this type of question does not guarantee a correct answer, but rather a desirable one [27]. Moreover, envy may or may not appear across a variety of workplace situations and person-situation interaction (Katz et al., 2017), and in some situations, as the literature has found, envy can motivate constructive behaviors [15]. Therefore, another question is whether the behaviors resulting from envy allow us to identify benign or malicious envy. As [1] state, it is important to distinguish the eventual consequences of envy from the experience of envy because these action tendencies do not define envy and only result from it. In this regard, benign envy is associated with a successful performance pattern as engagement (e.g. Refs. [28,29]). In this sense [29], highlighted the motivational function of benign envy increasing engagement at work. So, benign envy can motivate workers reducing the gap between them and the envied targets through their engagement at work. However, the malicious envy is linked to hostile behaviors as interpersonal counterproductive work behaviors (ICWB). So, when workers feel malicious envy towards other employees, they also exhibit more counterproductive work behaviors (e.g. Refs. [11,30,31]). On the other hand, some researchers have found that envy damages workers relationships and reduces the affective responses as work satisfaction (e.g. Refs. [32,33]).

Therefore, responding to the call by Ref. [34] in their recent meta-analytic review, new tools are needed to study work envy, but any new measures also need to integrate previous results and tools. We propose a new instrument to measure envy that provides some improvements over previous tools that use a particular assessment of different envy situations. This new measure is supported by the appraisal theory of [35]. According to their proposals, not only are competitive situations at work where people compare themselves to others important in provoking envy, but the way people appraise this situation is also relevant. [35]; p. 31) defined cognitive appraisal as “the process of categorizing an encounter, and its various facets, with respect to its significance for well-being”. Some people may appraise a situation at work as a challenge, whereas other people can experience it as a threat. Envy at work, as an individual social stressor (see Ref. [36]), can be associated with different types of appraisal and lead employees’ behavior to different work outcomes. As [37] point out, following Lazarus’ transactional model of stress [35], the pain caused by envy at work (stressor) can take different forms depending on how the person appraises what happens to him or her. In fact, research suggests that the two types of envy are linked to distinct appraisal patterns [38,39].

Therefore, based on [35] theory, this study presents a tool to measure how individuals assess different work situations when competition and comparison are present in the envy situation assessed.

The questionnaire we propose provides responses to different unresolved issues in the literature related to the evaluation of envy at work. Firstly, this questionnaire focuses only on envy in the workplace, and it considers everyday situations that may occur at work and cause envy, without mentioning the word envy in the items. Thus, it minimizes social desirability biases because, for most people, being an envious person is not socially desirable. Secondly, it deals with specific situations rather than general ones; that is asking about situations that may occur with co-workers. In other words, we understand that envy is not a generalized state of feeling inferior to others, but rather the result of the appraisal of the situation. Moreover, assessment using specific envy situations allows the person to feel more open to admitting these feelings than using a general measure of envy [40]. Thirdly, envy is not evaluated according to its reactions, but according to the type of appraisal. This avoids confusing envy with other concepts (such as injustice or admiration) with which it is closely linked [41]. Fourthly, we use the same situations to assess whether it can be perceived as a challenge (benign envy) or as a threat (malicious envy). The challenge perception means that the stressful situation might be deserved (balance between actions and results), but the person has the ability to restore the balance, whereas the threat perception means that the stressful situation might be undeserved, and the person does not feel control over it. In this regard, using the same question to evaluate benign and malicious envy can keep the relationships between envy and some of its antecedents and consequences from varying, as when using different measurement methods [34].

Thus, the aim of this study is to develop and validate a new tool to measure the way individuals assess envy at work in terms of challenge and threat appraisals: The Work Envy Appraisal Scale (WEAS). In this paper, we analyze the structure of the scale and

present its psychometric characteristics. We also provide the rules for the proper interpretation of the scores obtained. This project was approved by Human Research Ethical Committee of the Experimental Research Ethics (Number H1516265826265).

## 2. Method

The design of the scale was conducted by four phases: scale development, factor structure, reliability and validity assessment.

### 3. Phase 1. Scale's development

The aim of this phase was to construct the scale. The perception of work envy was measured with 10-items. These items represent work situations that can evoke envy and where competition and social comparison are present. These situations are derived from the work scenarios proposed by Ref. [40]. Moreover, we have added the assessment of each situation as a challenge and/or threat following [35] theoretical framework. The scale evaluates challenge and threat appraisals as two independent concepts that can arise simultaneously. Once the items were formulated, a six-point measurement scale was selected to avoid the negative effects of the midpoint [42,43]. Then, the scale was ranged from 1 (clearly, it is not a source of threat) to 6 (clearly, it is a source of threat) for threat appraisal, with a similar range for challenge appraisal.

In order to encourage respondents to consider the appraisal as both a threat and a challenge, and to avoid priming one kind of appraisal more than the other, we mentioned in the instructions that different conflict situations at work may be sources of both threat and challenge. Finally, we gave them the following instructions: "The following are some situations that may occur at work. For some people, these situations can be a challenge or a stimulus that drives them to grow, develop, and improve. Conversely, for others, these situations may be a source of threat and/or pressure. When you read each of the situations presented, please use the following scale to indicate to what extent you think it is a challenge and a threat".

### 4. Phase 2. factorial structure

The aim of this phase was to test the factor structure by means of Exploratory Factor Analysis. In addition, the internal consistency of the factors was analyzed using Reliability Analysis.

#### 4.1. Participants

The type of sampling used in this study was convenience sampling. Sample 1 was composed of 100 workers between 18 and 65 years old (Mean = 36.66 and SD = 11.59). Most of them had a university degree (76.8%) and were male (54%). With regard to the professional sector in which they worked, we structured the sample according to the classification of Spanish Ministry of Labor and Immigration, Administration, and Management (23%), trade and marketing (9%), healthcare (35%), sociocultural and community services (9%), crafts (1%), installation and maintenance (3%), tourism and accommodation (3%), others (3%), and missing (14%). The researchers informed them that the scale was anonymous and voluntary. Also, they received information about the informed consent before answering the survey. Participants with missing data were eliminated from the study.

**Table 1**  
Factor loadings for the WEAS structure.

English items	Spanish items	EFA Dimensions	
		Challenge	Threat
The promotion you were waiting for is given to another coworker in the same job position as you.	La promoción laboral que usted estaba esperando se la dan a otra/o compañera/o que ocupa el mismo puesto de trabajo que usted	0.586	0.623
Another coworker earns more money than you in the same job position.	Otro compañera/a gana más dinero que usted en el mismo puesto de trabajo	0.703	0.625
Another colleague has been assigned a better office than yours.	A otra/a compañera/o le han asignado un despacho mejor que el suyo.	0.749	0.637
You wanted to be on a new project but it has been assigned to another colleague instead of you.	Usted quería estar en un nuevo proyecto pero se lo han asignado a otra/o compañera/o en vez de a usted.	0.629	0.706
My colleague is assigned a job that I could do better and, moreover, he/she is congratulated for his performance.	A mi compañero/a le asignan un trabajo que yo podría hacer mejor que él y, además, le felicitan por su realización.	0.455	0.542
I was hoping to get a reward for my work but it's given to my colleague.	Yo estaba esperando conseguir una recompensa por mi trabajo pero se la asignan a mi compañera/o.	0.505	0.72
I don't have access to the company car or other benefits but my colleague does.	Yo no tengo acceso al coche de la empresa ni a otros beneficios pero mi compañera/o sí.	0.737	0.761
I have a fixed schedule and my colleague, who has the same job as me, has a flexible schedule.	Yo tengo un horario fijo y mi compañera/o, que tiene el mismo puesto de trabajo que yo, tiene un horario flexible.	0.742	0.686
You were waiting for a travel grant but it has been assigned to your partner and not to you.	Usted estaba esperando una ayuda económica para viajar pero se la han asignado a su compañera/o y no a usted.	0.718	0.74
Your coworker always gets better assignments than you do.	Un compañero/a siempre consigue mejores cosas que usted.	0.679	0.786

Note. EFA = Exploratory Factor Analysis.

## 4.2. Data analysis

This study was carried out in two steps [44]. In the first one, items were generated based on the theoretical basis of [35,40]. Subsequently, the scale was constructed, the factors were extracted using Exploratory Factor Analysis and the consistency of the factors was analyzed using Reliability Analysis.

Statistical analyses were carried out to analyze factor structure of the WEAS using IBM SPSS, version 26. The first step was to calculate the matrix of correlations. Then, the Kaiser-Meyer-Olkin (KMO) criterion and Bartlett's test [45] were calculated to determine the suitability of the data for factor analysis and measure the satisfactory number of correlations between the items. Next, we conducted an Exploratory Factor Analysis with Maximum Likelihood estimation (ML) and Direct Oblimin rotation to generate a conceptual model. Then, we calculated the internal consistency of the items in each factor (Cronbach's alpha).

## 4.3. Results: the dimensionality of the WEAS scale

Bartlett's test of sphericity was statistically significant ( $\chi^2 = 1125.21$ ;  $p < 0.001$ ), and Kaiser-Meyer-Olkin (KMO = 0.78) was greater than 0.60. These two tests showed that factor analysis could be used for this scale.

Based on Shapiro-Wilks and the Kolmogorov-Smirnov test, Sample 1 was not normally distributed ( $p = 0.001$ ). Then, we used maximum likelihood. One EFA was conducted that yielded two factors, and the variance explained for the factors was 46%. Table 1 presented the factor loadings for the two-factor structure: benign envy-challenge (loadings ranging from 0.788 to 0.563) and malicious envy-threat (loadings ranging from 0.758 to 0.478). Cronbach's alpha for the two factors was high, which indicated good item correlation ( $\text{Alpha}_{\text{Challenge}} = 0.88$  and  $\text{Alpha}_{\text{Threat}} = 0.90$ ).

These results obtained showed that WEAS was a reliable scale. WEAS was a two-factor scale and independently measured the perception of envy both as a challenge and as a threat.

## 5. Phase 3: reability, validation of the WEAS scale and psychometric properties

The aim of study 2 was to validate the scale and analyzed its psychometric properties in two samples of Spanish workers (samples 2 and 3). Specially, we tested the bifactorial structure of the WEAS using Confirmatory Factor Analysis (CFA). Moreover, we retested the reliability of the scale and carried out validation analyses.

### 5.1. Participants

In this study we have used two samples (sample 2 and sample 3). Sample 2 was composed of 219 workers between 21 and 63 years old (mean = 39.61 and SD = 10.68). Most of them were female (53.4%) and had a university degree (54.1%) and a high school degree (17%). With regard to the professional sector in which they worked, we structured the sample according to the classification of Spanish Ministry of Labor and Immigration: administration and management (42.5%), trade and marketing (18.3%), healthcare (5.9%), sociocultural and community services (6.8%), installation and maintenance (4.6%), tourism and accommodation (3.2%), IT and communications (0.9%), transport and vehicle maintenance (2.3%), building and civil engineering (1.4%), mechanical manufacturing (1.4%), personal image (1.8%), others (0.5%), and missing (10.5%).

Sample 3 was composed of 532 workers between 18 and 70 years old (mean age = 37.20 and SD = 10.97). Most of them had a university degree (69.1%) and were female (51.9%). With regard to the professional sector in which they worked, we structured the sample according to the classification of Spanish Ministry of Labor and Immigration: administration and management (31.5%), trade and marketing (13.5%), healthcare (13%), sociocultural and community services (11.7%), others (16.6%), installation and maintenance (3.3%), tourism and accommodation (3.1%), IT and communications (1.7%), transport and vehicle maintenance (1.9%), building and civil engineering (0.9%), mechanical manufacturing (0.9%), personal image (0.9%), crafts (0.4%), electricity and electronics (0.4%), textile, clothing and leather (0.2%), graphic arts (0.2%).

### 5.2. Instruments

#### 5.2.1. Work Envy Appraisal Scale (WEAS)

This scale includes 10-item which measure envy at work as threat and/or challenge. Example of item was as follows: "The promotion you were waiting for is given to another coworker in the same job position as you". The items were rated on a 6-point Likert-scale ranging from 1 (it is clearly not) to 6 (it clearly is). The development of the scale is described in Study 1.

#### 5.2.2. Interpersonal counterproductive work behavior (ICWB)

We analyzed interpersonal counterproductive work behavior with the Interpersonal Counterproductive Work Behavior scale [46]. This unidimensional scale has 12 items (e.g. "Look down on her"). Each item was responded to on a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree). Cronbach's alpha was 0.92.

#### 5.2.3. Work satisfaction

A questionnaire adapted by Ref. [47] was used to measure job satisfaction. It combines a one-item measure of job satisfaction ("Overall, how satisfied are you with your job?") and a four-item scale that refers to satisfaction with job aspects (job security, salary,

co-worker friendliness, and supervisor competence). This four-item scale is derived from the Minnesota Satisfaction Questionnaire [48]. To these five items, we added an item on satisfaction with supervision (item 6) from the Satisfaction Questionnaire S10/12 by Ref. [49]. A Likert-type five-point response scale (1 = Dissatisfied to 5 = Very satisfied) is used to answer the six items. The Cronbach's alpha was 0.76.

5.2.4. Engagement

We analyzed engagement with the Utrecht Work Engagement Scale-9S (UWES-9S) [50]. This scale has nine items (e.g., "At my work, I feel bursting with energy") and a six-point response scale (1 = Never; 6 = Always) Adequate psychometric characteristics of the scale for three factors and a single factor were confirmed in Ref. [50]. Cronbach's alpha was 0.93.

5.3. Data analysis

To evaluate the psychometric properties of the WEAS we used IBM SPSS, version 26, and EQS, version 6.1. The validation process continued with three Confirmatory Factor Analyses. The aim was to confirm the structure obtained in the EFA model. A CFA with ML for parameter estimation was performed with Sample 2. Goodness of fit was assessed using the  $\chi^2$  statistic with Satorra –Bentler correction and  $\chi^2/d.f. < 2$  [51]. Moreover, we used the NNFI, Comparative Fit Index (CFI), and Root Mean Square Error of Approximation (RMSEA). Values close to or above 0.90 are considered a good fit for the Non-Normed Fit Index (NNFI), Comparative Fit Index (CFI) [52], and Incremental Fit Index (IFI) [53], and 0.08 for RMSEA [54]. Then, we used absolute [55] and relative indices [56] to evaluate fit. Afterwards, we used a multisampling CFA to replicate the model with Sample 3. Multisampling CFA was a rigorous test of the model's proposed structure, as well as the degree of invariance in the relationships found in two different samples [57,58].

Third, we calculated convergent and discriminant validity. We computed the average variance extracted (AVE). Following [59]; we computed the AVE. An AVE  $\geq 0.5$  shows that there is adequate convergent validity and if factor loadings are equal to or greater than 0.5, means that scale items about that specific construct share sufficient variance in common [60]. Moreover, we calculated the correlations between the latent variables. The results obtained were compared with the value of the square root of the mean variance extracted ( $\sqrt{AVE}$ ). A good fit exists when all the correlations obtain a value less than the value of  $\sqrt{AVE}$ , which indicates that each factor is different from the other factors. In addition, correlations were carried out with other related constructs described in the literature on the topic. Specifically, correlations were carried out with interpersonal counterproductive work behavior, engagement, and work satisfaction. The low correlations indicated convergent and discriminant validity.

Fourth, we calculated Cronbach's alpha, Guttman's Split-half Coefficient, and Composite Reliability Coefficient (CR) to analyze the reliability of the scale. Values greater than 0.70/0.80 are considered adequate and optimal, respectively. Finally, we calculated the scores for each subscale and constructed the interpretation norms.

5.4. Results

The model generation phase began with construct validity. Three confirmatory factor analyses (CFA) were carried out. In CFA-1, we carried out the CFA with the unifactorial structure in Sample 2. Then, we conducted a second CFA (CFA-2) with a two-factor structure (benign envy-challenge and malicious envy-threat) following the EFA model. The third CFA (CFA-3) was tested with a multigroup CFA in Sample 3, with a two-factor structure. We use the robust maximum likelihood estimation method because sample 2 and 3 do not follow the normal distribution (skewness and Kurtosis values between -1.5 and 1).

Table 2 shows the fit indices for the three CFAs. The fit indices supported a multidimensionality to the measurement of envy. A satisfactory NNFI, CFI, IFI, and RMSEA can be observed. This was not the case for the unifactorial model. Moreover, factor loadings obtained in the two-factor model ranged from 0.649 to 0.80. These results showed that scale items asking about a specific construct share sufficient variance in common. The multisampling CFA obtained good fit indices for the model structure (see Table 2). Thus, content validity was confirmed.

The AVE values for the two factors (Challenge = 0.51; Threat = 0.57) were  $>0.50$  [61] (Table 4). This result shows that the WEAS has convergent validity. Moreover, based on the bifactorial structure of the scale analyzed in the CFA, two factors were constructed. Table 3 shows correlations between two factors from the WEAS and ICWB, resilience and work satisfaction. The value of the correlations was not high, and, therefore, according to Ref. [62]; the correlation between the scales confirms the convergent and discriminant validity of the WEAS as well. The correlation between the two factors was  $-0.025$  ( $\rho = 0.001$ ), and this correlation was less than the value of  $\sqrt{AVE}$  (Table 4). Following the recommendations of [59]; discriminant validity was confirmed.

Table 4 presents the reliability coefficients for each factor. The CF values for the two factors were  $>0.70$ , which indicated, based on

**Table 2**  
Goodness of fit indices for confirmatory analysis of the three competing models.

Scales	$\chi^2$	d.f.	$\chi^2/d.f.$	NNFI	CFI	IFI	RMSEA
One-factor Model	1206.7914	170	7.09	0.48	0.57	0.54	0.16
Two-factor model	275.55	169	1.63	0.95	0.95	0.95	0.05
Multigroup	576.79	169	3.41	0.90	0.90	0.90	0.07

Note.  $\chi^2$  = chi-square; df = degrees of freedom; IFI= Incremental Fit Index; NNFI= Non-Normed Fit Index; CFI= Comparative Fit Index; RMSEA = Root Mean Square Error of Approximation.

**Table 3**

Correlations between the two factors of envy and the ICWB, resilience and work satisfaction.

Dimensions	ICWB	Engagement	Work satisfaction
Benign Envy-Challenge	0.041	0.200**	0.130*
Malicious Envy-Threat	0.274**	-0.122**	-0.115*

Note. ICWB= Interpersonal counterproductive work behavior.

**Table 4**

Fit of reliability of two factors of the WEAS.

Dimensions	Alpha	CR	Spearman-Brown's split-half coefficient	Guttman's Split-Half Coefficient	AVE	$\sqrt{\text{AVE}}$
Benign Envy-Challenge	0.91	0.91	0.88	0.88	0.51	0.72
Malicious Envy-Threat	0.93	0.93	0.90	0.90	0.57	0.75

Note. CR = composite reliability; AVE = average variance extracted;  $\sqrt{\text{AVE}}$  = square root of the mean variance extracted.

[63]; high reliability of the two-factor model. In the same way, Cronbach's alpha, Spearman-Brown, and Guttman's Split-Half Coefficient were also high, which indicated good or excellent reliability.

Finally, we analyzed cut-off scores to elaborate normative data for the envy. The Mologorov-Smirnov test had significant results ( $p_{\text{Challenge}} = 0.008$ ;  $p_{\text{Threat}} = 0.036$ ); so, this sample had a non-normal distribution. Table 5 presents the mean and standard deviation for each factor. Subsequently, we calculated the percentiles (Table 6) to establish the statistical norms.

The results provided evidence of the scale's reliability and validity and supported the use of the Work Envy Appraisal Scale in Spanish workers.

## 6. Discussion

The objective of this study was to develop and validate the structure of a novel tool to measure envy at work, the Work Envy Appraisal Scale (WEAS). Its psychometric characteristics have been presented, as well as the norms for the interpretation of the scale scores for Spanish workers. The findings present the WEAS as a reliable and valid tool for measuring envy at work appraised as challenge and as threat.

The consistent of the results obtained with other studies suggests that the two types of envy at work are linked to distinct appraisal patterns [37–39]. Furthermore, the correlations between envy and job satisfaction, engagement, and counterproductive work behaviors proved the criterion validity of the WEAS. These variables were differentially associated to the two appraisals of envy at work. Moreover, these results were in line with our expectations and consistent with the literature reviewed [6,11,31–33]. On the other hand, our results showed, as [64] suggested, that when people appraise an envy situation as a challenge (benign envy), they initiate challenging behaviors and feel work satisfaction. This is only possible because they perceive the necessary control to restore the balance provoked by an envy situation. However, when they perceive the work situation of envy as a threat (malicious envy), they initiate interpersonal counterproductive work behaviors, and they do not feel work satisfaction. This means that the stressful situation could be undeserved, and that the person does not have enough control to achieve balance.

This study contributes to research on envy at work by answering the main questions raised in the current literature on the assessment of envy. Thus, discerning the challenge and threat appraisal, allows for addressing social desirability issues. Considering this, the scale has been built avoiding the word 'envy' to prevent its possible negative connotation [27]. Furthermore, the WEAS scale evaluates day-to-day work situations that can cause envy rather than being a general evaluation measure of envy [40]. In addition, envy is an emotion that is linked to other psychosocial issues (e.g., admiration, injustice, etc.) [41]. Thus, assessing envy by its consequences could lead to confusing envy with other topics. However, in WEAS scale, envy is not evaluated according to its reactions, but according to the type of appraisal. Therefore, the WEAS scale captures the emotion better than other scales.

Finally, the scale allows measuring benign envy and malicious envy using the same items. This offers an evaluation of benign and malicious envy without the need to use different scales. In this regard, by using the same item to evaluate benign and malicious envy, we can avoid variance in the relationships between envy and some of its antecedents and consequences due to the use of different measurement methods [34].

**Table 5**

Means and standard deviations of the two factors, challenge/threat, for sample 3.

	Mean	SD
Benign Envy-Challenge	2.90	1.11
Malicious Envy-Threat	3.30	1.23

Note. SD= Standard Deviation.

**Table 6**  
Percentiles of the WEAS subscales for Sample 3.

	Challenge	Threat
10	1.30	1.39
20	1.86	2.10
25	2.00	2.40
30	2.20	2.60
40	2.50	3.00
50	2.90	3.30
60	3.10	3.54
70	3.40	3.80
75	3.60	4.10
80	3.80	4.30
90	4.40	4.80

## 7. Limitations and future research

These results have been obtained using a convenience sample so that they have limited generalizability. Anyway, the sample used included different professional sectors. Consequently, to make generalizations further studies and the incorporation of additional occupational groups will be necessary to reexamine the present scale empirically. Moreover, studies on specific professions should also be developed. It would also be interesting to analyze the factorial invariance according to professional category and the socioeconomic status linked to it. Nevertheless, the WEAS presents adequate psychometric properties, which means the scale can be used in Spanish-speaking samples.

Likewise, it is expected that the WEAS Scale can be applicable across different countries. However, this study has been developed with a sample of Spanish workers. Thus, future research is necessary to attain further validation of the WEAS Scale across other countries. Also, the nature of this study was cross-sectional. Further research should use longitudinal designs because envy is an emotion that can change over time.

Finally, in the present study we use a scenario methodology. It would be interesting to carry out using real situations where workers were directly involved. However, the scenarios used were representative of work situations that normally provoke envy.

## 8. Practical implications

In sum, we think that our findings have implications for managers' interventions in envy at work. Currently, the competition and comparison process in the workplace is increasing, and envy is becoming more and more frequent [65,66]. Therefore, managers should have intervention plans to transform these envy work situations into challenges and avoid their appraisal as a threat. Our results indicate that the perception of envy as a challenge leads to challenging behaviors and job satisfaction. However, the perception of envy as a threat is associated with counterproductive interpersonal work behaviors. Moreover, as the literature points out, this has negative effects on work climate and job performance (see Ref. [3]). Hence, the manager, as [1] suggest, could encourage good relationships, manage all kinds of work pressures, and instill self-confidence in order to manage envy at work. Likewise, organizations should strengthen the climate of cooperation and communication and team spirit. Furthermore, it is necessary to establish clear performance objectives and provide employees with a sense of control by empowering them. At the same time, it might be necessary to avoid comparison situations by using job rotations and balancing resources and rewards. Furthermore, it would be important to make workers aware that envy is a normal feeling and encourage them to share the situations that concern them, creating programs to improve work situations that can produce envy. In summary, both managers and organizations have an essential role to play in reducing envy in the workplace by creating a good work climate, transparent and fair organizational policies, counseling, coaching and feedback for employees, and a culture that minimizes social comparisons (see Ref. [3]).

## 9. Conclusion

Envy is an important emotion that affects workers' behavior and performance. There are several instruments to measure envy, but the Work Envy Appraisal Scale (WEAS) enables the assessment of benign and malicious envy using the cognitive appraisal of different envy work scenarios. Moreover, our results revealed that it is an instrument reliable and valid. Differentiating envy from its appraisal as a challenge and threat permits to answer some of the current research questions on the evaluation of envy. In this regard, the WEAS scale is a very useful, simple and appropriate instrument that can improve the research on envy at work.

## Author contribution statement

Pilar González-Navarro; Lucia I. Llinares-Insa; Rosario Zurriaga-Lloréns: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

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## Data availability statement

Data associated with this study has been deposited at <https://www.dropbox.com/scl/fi/h6zd0o4cec32lp9qqpogy/Envy.xlsx?dl=0&rlkey=bhe1atspdbezz35rlcu1iazx8>.

## Declaration of interest's statement

The authors declare no competing interests.

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