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# Italian adaptation of the Workplace Ostracism Scale: A psychometric analysis based on item response theory

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## Abstract

**Introduction:** The term Workplace Ostracism (WO) refers to a specific form of social exclusion, involving the perception of being ignored and/or excluded by colleagues or supervisors at the workplace. Given the harmful consequences of WO on both individual and organizational outcomes, the assessment of this phenomenon is crucial. The current study aims to examine the psychometric properties of the Workplace Ostracism Scale (WOS), the most commonly used tool for WO evaluation.

**Methods:** A sample of 441 Italian employees (53.3% males;  $M_{age} = 35$ ,  $SD = 9.98$ ) was recruited via the Prolific Academic platform. We conducted analyses using an Item Response Theory (IRT) framework.

**Results:** Our results confirmed the unidimensionality of the scale [ $\chi^2_{(34)} = 68.962$ ,  $p < .001$ , CFI = .963, TLI = .951, RMSEA = .048 (.032 - .065), SRMR = .035] and suggested that the instrument was more informative at higher levels of the trait. The negative associations between WOS  $\theta$  scores and outcomes, including job satisfaction, job engagement, organizational citizenship behavior, and life satisfaction, supported the validity of the scale. Differential Item Functioning (DIF) analyses indicated that the WOS showed minimal gender non-invariance and was invariant across age groups.

**Conclusions:** Our findings suggest that the WOS is a robust measure for assessing acute cases of workplace ostracism, which enhances its utility in high-risk settings.

**Take-home Message:** Evaluating workplace ostracism (WO) is essential as it affects individual well-being and organizational outcomes. The WOS is a reliable and valid tool that is particularly effective in assessing severe cases of WO.

**Keywords:** DIF; IRT; workplace violence; workplace ostracism; workplace ostracism scale.

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## INTRODUCTION

Workplace ostracism (WO) is defined as a specific form of social exclusion, encompassing individual perceptions of being overlooked and/or excluded from social interactions or work-related activities by other employees or supervisors [1,2]. WO has been explored in connection with individual-directed and organizational-directed behaviors [3]: Drawing from a social identity framework [4], when individuals experience dissatisfaction with their social group status (e.g., ostracized), they are more likely to leave the social group. That is, WO is detrimental to citizenship behavior (individual and organizational) via the identification mechanism, as workers who do not identify with their organizations will not engage in activities that benefit their colleagues and the organization as a whole [3]. In other words, WO decreases citizenship behaviors by weakening employees' identification with the organization.

A recent, holistic, and up-to-date systematic review by Sharma and Dhar [5] indicated that WO is grounded in several theoretical frameworks, such as the conservation resources theory [6], social exchange theory [7], and belongingness theory [8]. While these theoretical perspectives offer diverse viewpoints (please, see the work mentioned above for a deeper explanation), studies on WO align with the notion that being ostracized is harmful to both personal well-being and organizational outcomes. Regarding work-related outcomes, previous studies have reported associations with reduced job satisfaction, job commitment, and job performance [9-13]. Individuals who perceive ostracism may experience lowered mood and reduced self-esteem; these negative effects on well-being, emotions, and self-perceptions, in turn, are more likely to worsen organizational perceptions, encourage turnover, lessen sense of belongingness, and undermine performance. Ostracized individuals tend to show a reduced degree of commitment and may withdraw from their organization, likely as a result of poor well-being and/or a perception of being unwanted. This perspective coincides with the victimization framework, which suggests that ostracism results in the denial of needs [11].

Previous authors [2,14] have also suggested that WO is both a form of maltreatment (i.e., when an employee starts counter normative negative actions or desists normative positive actions towards another employee) and incivility (i.e., workplace behaviors that specifically violate norms, have an ambiguous intent, and have a low intensity). However, not all forms of mistreatment and incivility can be seen as suitable examples of ostracism. For instance, physical aggression constitutes mistreatment but not ostracism, while gossiping about someone represents incivility but not necessarily ostracism. Thus, although closely related, ostracism is distinct from both maltreatment and incivility, as well as from other kinds of mistreatment [1,11]. What distinguishes WO from other workplace aggressive or deviant behaviors is that it is defined as an act of omission, characterized by low intensity, lack of clear intent to harm, and ambiguity [14]. In line with this premise, some studies have reported that WO has a unique impact compared to other forms of mistreatments at work, suggesting, as an example, that experiences involving WO may have worse effects on self-esteem than bullying [15] and lead to less approach-oriented coping responses than incivility, aggression, and harassment [2, 16].

A recent meta-analysis by Howard et al. [11] investigated whether demographic characteristics make some individuals more vulnerable than others to experiencing WO. Their findings reported small but significant relationships with gender (with men reporting higher levels of ostracism) and employment status (with part-time employees reporting higher levels of ostracism), but not with age. These results imply that individual characteristics may serve as secondary antecedents of WO, which remains a broadly universal phenomenon that affects individuals regardless of their demographics [1]. However, WO studies have generally included demographic variables as control variables [3,11,16] instead of focusing on potential effects.

### ***Measuring Workplace Ostracism: The Workplace Ostracism Scale (WOS)***

The literature on WO has gained popularity since 2008, when Ferris et al. developed their Workplace Ostracism Scale (WOS). It is a 10-item measure assessing the frequency with which respondents have been the target of WO within the past year, and it is the most popular self-report measure used for evaluating this construct. Using six independent samples, the authors provided the first evidence regarding the reliability, validity, and nomological network of the construct, alongside pioneering efforts directed towards its assessment. Specifically, their findings suggested a unidimensional structure for the scale, supported by the application of confirmatory factor analyses: Meeting the conventional thresholds [17], CFI greater than .95, SRMR between .03 and .04, together with significant factor loadings ( $\lambda > .50$ ) of each item on the latent WO

factor, the unidimensional model provided evidence of an acceptable fit to the data across the samples. Concerning internal consistency, their results suggested its adequateness: Cronbach's alphas exceeded .89, the average of corrected item-total correlations ranged from .65 to .86, and interitem correlations were significant and positive. Construct validity was evaluated through the inspection of the correlations with related variables: WOS scores were significantly and positively related to social undermining, whereas negative associations were estimated with perceived organizational support, interpersonal justice, leader-member exchange, and group cohesion. However, the magnitude of these associations ( $< |.60|$ ) supported the distinctiveness of the WO construct. Proofs of criterion validity was provided by significant and negative associations with self-esteem, sense of belongingness, control, meaningful existence, job satisfaction, and commitment. Also, as further support for criterion validity, WOS scores were positively associated with anxiety, stress, and withdrawal, job search behaviors, and turnover.

Recently, Kamboj and Garg [18] have conducted a psychometric investigation of the WOS: While their findings supported the unidimensionality of the scale, as well as demonstrated good levels of internal reliability, construct, and criterion validity, two items (item 3 and item 4) were excluded due to their poor performance, resulting in an 8-item measure. Additionally, it is surprising that despite the widespread use and citation of the WOS (the original paper by Ferris et al. (2008) counts more than 600 citations on Scopus), cross-cultural validations of the scale are lacking. Furthermore, there have been no contributions employing Item Response Theory (IRT) to analyze the scale.

### ***Research goals and hypotheses***

Given these premises, the goals of the current study were: a) to contribute to the cross-validation of the WOS using an Italian sample; b) to investigate the psychometric properties of the scale by applying the Item Response Theory (IRT) approach, a robust statistical method that allows to evaluate how well an item performs in assessing the latent construct, as well as the level of the construct targeted by the item [19]. Also, we aimed to examine the associations between WOS scores and related variables. Stemming from existing literature [9–13], we expected that WOS scores would be negatively associated with job satisfaction, job engagement, organizational citizenship, and life satisfaction.

## **METHODS**

### ***Participants and Procedure***

Participants were recruited on Prolific Academic, a crowdsourcing platform widely recognized for producing high-quality data in behavioral and social science research. We chose this platform to ensure a wide range of participants, including individuals from various organizations and demographic backgrounds. Participants received a reward of .40€ for their participation. To take part in the research study, they were required to have an approval rate on the platform of at least 95%, be older than 18 years old, be native Italian speakers, and be employees. Our sample was composed of 441 individuals (53.3% males; 45.8% females; .7% did not specify) aged from 19 to 67 years old ( $M_{age} = 35$ ,  $SD = 9.98$ ). They had a permanent (66.2%) or fixed (33.8%) contract and most of them had a full-time job (79.7%). Regarding longevity in the current organization, 19.4% have been working for less than one year, 30% for less than three years, 18.7% for between three years and five years, and 31.9% for at least five years. Participants were first explained the research goals; they were assured that the data gathered would be treated collectively and that the anonymity of the data would be maintained. The research project was carried out in accordance with the Declaration of Helsinki and approved by the Internal Review Board of the psychological research of the University of Enna, Italy.

### ***Instruments***

Before embarking on the study, the authors, with adequate proficiency in both languages, first translated the items of the original WOS [1] into Italian. Any minor discrepancies between the two independent translations were resolved through discussions between the researchers, with the involvement of two other team members. The resulting version was then back-translated and compared to the original form. Subsequently, the translated version was deemed ready for use. The original WOS items, as well as their translations in Italian, are provided in the Appendix. In the following section a detailed description of each scale used in the current research is provided. Table 1 summarizes each study variable along with its corresponding measure.

### ***Workplace Ostracism***

To evaluate ostracism at the workplace we used the Workplace Scale (WOS). It is a unidimensional measure composed of 10 items rated on a 7-point Likert scale (from 1 = never to 7 = always).

### *Job Satisfaction*

We used the Italian version [20] of the Job Satisfaction (JSS) [21] to evaluate job satisfaction. It is a 7-item scale rated on a 7-point Likert scale (from 1 = completely disagree to 7 = completely agree).

### *Job Engagement*

We used the Italian-adapted version [22] of the Utrecht Work Engagement Scale (UWES-9) [23] to investigate job engagement. This measure consists of 9 items, distributed into three subscales: vigor, dedication, and absorption. Responses to items are given on a frequency Likert scale varying from 0 (never) to 6 (always).

### *Organizational Citizenship Behaviors*

We used the Italian version [24] of Podsakoff et al. [25] Organizational Citizenship Behavior (OCB) questionnaire, which includes 24 items evaluating three factors: altruism, conscientiousness, and civic virtue. Participants evaluated each behavior using a 7-point Likert scale (from 1 = it doesn't describe me at all to 7 = it describes me completely).

**Table 1.** Variables and measures.

<i>Variable</i>	<i>Measure</i>
Workplace Ostracism	Workplace Ostracism Scale (WOS)
Job Satisfaction	Job Satisfaction Scale (JSS)
Job Engagement	Utrecht Work Engagement Scale (UWES-9)
Organizational Citizenship Behaviors	Organizational Citizenship Behaviors Questionnaire (OCB)

### *Data analyses*

After checking univariate and multivariate normal distribution, we tested whether the one-factor structure of the WOS adequately fitted our data in order to ensure that item parameter estimates accurately reflected only one latent trait. The unidimensionality of the scale was investigated by performing a confirmatory factor analysis on Mplus 7 software [26]. We applied the Robust Maximum Likelihood (MLR) estimation procedure, as it provides a more robust measure of fit when data are not normally distributed and is more suitable for ordinal Likert-scale questionnaire data [27, 28]. We used several indices to examine the fit of the model: the Comparative Fit Index (CFI), the Tucker Lewis fit Index (TLI), Root Mean Square of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR). CFI and TLI values greater than 0.95 or 0.97 were considered indicative of acceptable or good model fit, respectively; RMSEA values of  $\leq 0.08$  or  $0.05$  were judged to indicate acceptable or excellent fit, and SRMR should not exceed 0.05 for good fit [17].

We conducted IRT analyses using IRTPRO software [29], and, based on the response format, we applied the graded response model (GRM), which can be meant as a natural extension of the 2PL model. As a preliminary step, we tested the presence of local dependence (LD), by computing the  $\chi^2$  LD statistic [30], and values exceeding 10 were interpreted as indicators of LD. Then, the GRM was performed. Such a model estimates a unique slope parameter for each item (discrimination parameter,  $a$ ), along with a number of thresholds (location parameter,  $b$ ) equal to the number of responses minus 1. As each WOS item is rated on a 7-point Likert scale, there are six threshold parameters and one unique slope parameter to be tested for each item. Thus, with 10 items, a total of 70 parameters are estimated (i.e., 10 unique slope parameters across items and six threshold parameters per each item for a total of  $10+6*10=70$ ).

We evaluated the fit of the model by computing the  $M_2$  statistic [31] and the associated RMSEA value. Because  $M_2$  statistic is strictly related to sample size, the RMSEA provides a more reliable index of model fit, and values equal or inferior to 0.05 are indicative of a good fit.

In order to interpret the discrimination parameter (i.e., the ability of an item to discriminate among people with different levels of the underlying trait), we followed Baker and Kim's [32] guidelines, according to which  $a$  values ranging from 0.01 to 0.34 are interpreted as very low, from 0.35 to 0.64 are considered low, from 0.65 to 1.34 are interpreted as moderate, from 1.35 to 1.69 are high, and 1.70 or higher values are interpreted as very high. We further inspected the TIF, which provides a graphic evaluation of the precision of the test at different levels of the measured construct [33, 34].

Subsequently, to investigate the validity of the scale, we computed IRT estimate scores of  $\theta$  values with the EAP estimation method [35], which allows an evaluation of the trait level of each respondent concurrently with the item parameters. We then computed Pearson correlations between the WOS  $\theta$  values and scores on SWLS, UWES-9, JSS, and OCB. Finally, we inspected whether WOS items showed DIF based on gender and age. DIF analyses were performed for each demographic variable separately.

## RESULTS

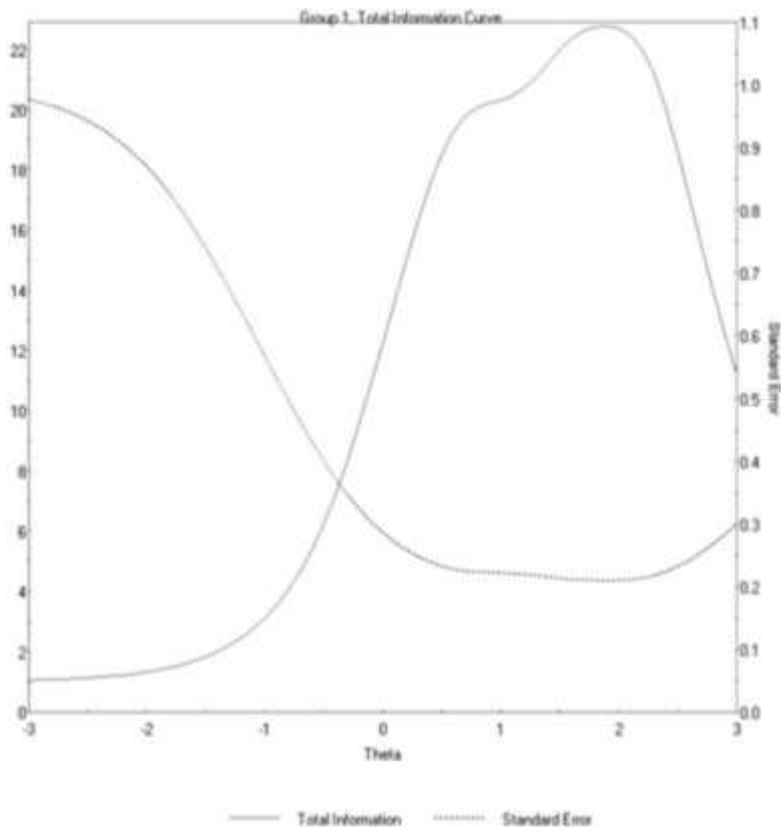
As a preliminary step, the descriptives and item distributions were evaluated. As displayed in Table 2, indices of skewness and kurtosis indicated a high departure from normality. The analysis of the factor structure of the scale, tested by CFA, revealed that the unidimensional model was barely acceptable, as indicated by the fit indices:  $\chi^2_{(35)} = 81.891$ ,  $p < .001$ , CFI = .950, TLI = .936, RMSEA = .055 (.040 - .071), SRMR = .038. Modification indices (MIs) suggested adding error covariance between item 4 (You involuntarily sat alone in a crowded lunchroom at work) and item 5 (Others avoided you at work). The modified model showed an acceptable fit:  $\chi^2_{(34)} = 68.962$ ,  $p < .001$ , CFI = .963, TLI = .951, RMSEA = .048 (.032 - .065), SRMR = .035. All factor loadings were significant ( $p < .001$ ), ranging from .54 to .79 (see Table 1). The examination of LD statistics suggested the absence of high covariation among item responses, as all coefficients were lower than 10. Therefore, the assumptions for applying the unidimensional IRT analyses were met. The Graded Response Model (GRM) was performed to test the item threshold and discrimination parameters. The fit statistics indicated an adequate fit ( $M_2 = 1064.72$ ,  $df = 781$ ,  $p < .001$ , RMSEA = .030). Item parameter estimates were then inspected. Regarding the threshold parameters ( $b$ ), results showed that the item categories provide an adequate differentiation in evaluating regions around the mean trait and approximately 3 SD above the mean. In terms of discrimination parameters, following Baker and Kim's [32] criteria, the findings indicated that all items had a high discrimination power (see Table 1). With respect to reliability, as shown in Figure 1, the TIF suggested that the measure was adequately informative from medium to high levels of the trait. In detail, starting from the mean, the amount of test information exceeded 13, it reached the highest information for about 2 SD above the mean, with a corresponding SE of about 0.2. As the associated reliability is 1 minus  $SE^2$ , this means that the reliability was higher than .96 for this range of the trait.

**Table 2.** Descriptives, indices of normality, and standardized factor loadings of WOS items (n = 441).

Item	<i>M</i>	<i>SD</i>	Skewness	Kurtosis	$\lambda$	<i>a</i> (SE)	<i>b1</i> (SE)	<i>b2</i> (SE)	<i>b3</i> (SE)	<i>b4</i> (SE)	<i>b5</i> (SE)
WOS1	2.22	1.29	.96	.15	.63	1.91 (0.17)	-0.39 (0.08)	0.64 (0.08)	1.29 (0.11)	2.01 (0.16)	2.81 (0.26)
WOS2	1.24	.55	2.67	7.68	.54	2.30 (0.29)	1.15 (0.10)	2.13 (0.19)	2.77 (0.29)		
WOS3	1.46	.74	1.78	3.46	.61	1.99 (0.21)	0.54 (0.08)	1.79 (0.15)	2.60 (0.24)	3.47 (0.45)	
WOS4	1.71	1.09	1.66	2.36	.54	1.67 (0.18)	0.46 (0.08)	1.25 (0.12)	2.06 (0.19)	2.70 (0.27)	3.48 (0.41)
WOS5	1.41	.76	2.44	6.94	.73	3.81 (0.45)	0.64 (0.07)	1.63 (0.11)	1.93 (0.13)		
WOS6	1.65	.93	1.53	1.94	.78	3.16 (0.32)	0.28 (0.06)	1.18 (0.09)	1.76 (0.12)		
WOS7	1.82	1.02	1.23	.87	.79	3.00 (0.28)	0.05 (0.07)	0.98 (0.08)	1.57 (0.11)		
WOS8	1.33	.67	2.12	4.01	.71	3.20 (0.37)	0.85 (0.07)	1.55 (0.11)	2.21 (0.17)		
WOS9	1.60	.98	1.87	3.37	.76	3.00 (0.31)	0.46 (0.07)	1.22 (0.09)	1.75 (0.12)	2.20 (0.17)	2.79 (0.29)
WOS10	1.88	1.21	1.51	1.80	.63	1.89 (0.18)	0.14 (0.08)	1.03 (0.10)	1.68 (0.14)	2.18 (0.18)	2.82 (0.27)

Note:  $\lambda$  = Standardized factor loadings;  $a$  = discrimination parameter;  $b$  = threshold parameter; SE = standard error.

**Figure 1.** Test information function of the WOS under the graded response model (GRM).



### Validity

The construct validity of the WOS was examined by examining Pearson's correlations between WOS  $\theta$  scores and related variables. As depicted in Table 3, WOS  $\theta$  scores reported associations in the expected directions. Specifically, WOS  $\theta$  scores were negatively and moderately associated with job-related constructs (i.e., job satisfaction, job engagement, and organizational citizenship behaviors) and personal outcomes (i.e., life satisfaction).

**Table 3.** Descriptives and bivariate correlations between WOS  $\theta$  scores and related variables (n = 441).

Variable	1	2	3	4	5	6	7	8	9
1. WOS $\theta$ scores	-								
2. JSS	-.28***	-							
3. UWES_V	-.23***	.79***	-						
4. UWES_D	-.21***	.85***	.79***	-					
5. UWES_A	-.12*	.65***	.72***	.72***	-				
6. OCB_A	-.32***	.31***	.31***	.31***	.39***	-			
7. OCB_CV	-.20***	.43***	.43***	.45***	.40***	.43***	-		
8. OCB_C	-.24***	.27***	.36***	.30***	.37***	.35***	.37***	-	
9. SWLS	-.19***	.46***	.47***	.45***	.32***	.20***	.31***	.15***	-
M	.00	23.01	11.90	13.51	13.32	33.38	19.14	27.39	20.80
SD	.92	6.40	4.26	4.47	4.13	5.49	5.27	5.03	6.88

Note: WOS = Workplace Ostracism Scale; JSS = Job Satisfaction Scale; UWES\_V = Utrecht Work Engagement Scale\_Vigor; UWES\_D = Utrecht Work Engagement Scale\_Dedication; UWES\_A = Utrecht Work Engagement Scale\_Absorption;

OCB\_A= Organizational Citizenship Behaviors \_Altruism; OCB\_CV = Organizational Citizenship Behaviors\_ Civic Virtue; OCB\_C = Organizational Citizenship Behaviors \_Coscientiousness.

### Gender measurement invariance

We evaluated gender DIF using male group as the reference group and the female group as the focal group. As reported in Table 4, the items did not show DIF ( $p$  from .079 to .959), with the exception of item 7, which reported significant DIF on the discrimination parameter ( $p = .005$ ) and for the threshold parameter ( $p = .038$ ), and item 1, which showed significant DIF on the discrimination parameter ( $p = .027$ ), but not for the threshold parameter ( $p = .257$ ).

We then proceeded with the DIF detection procedure, using all items that did not exhibit DIF as anchors. These anchor items were assumed to be free from DIF and were used to estimate the trait and to link the two groups in terms of trait levels. During this iterative process, the DIF status of items may change. In particular, the status of item 7 changed in terms of the threshold parameter ( $\chi^2_{(4)} = 7.7, p = .102$ ). However, item 1 still reported DIF on the discrimination parameter ( $\chi^2_{(1)} = 8, p = .005$ ). As 20% of the WOS items reported DIF, we assumed that the WOS scale exhibited minor non-invariance [36]. However, due to the small amount of DIF, we investigated gender differences in WOS  $\theta$  scores by not removing DIF items. A significant discrepancy was estimated  $t_{(439)} = 2.59, p < .05$ , with males reporting higher scores than females (males:  $M = .10, SD = .94$ ; females:  $M = -.12, SD = .89$ ).

**Table 4.** Differential Item Functioning (DIF) of the WOS items across gender (n = 441).

Item	aDIF			bDIF		
	$\chi^2$	df	p	$\chi^2$	df	p
WOS1	4.9	1	.027	6.6	5	.257
WOS2	3.1	1	.079	3.0	3	.394
WOS3	2.2	1	.137	2.9	4	.580
WOS4	0.6	1	.455	7.6	5	.180
WOS5	1.9	1	.164	2.0	4	.730
WOS6	3.4	1	.065	7.3	4	.120
WOS7	7.8	1	.005	10.1	4	.034
WOS8	0.8	1	.370	1.2	3	.759
WOS9	0.0	1	.959	4.4	5	.489
WOS10	0.6	1	.457	7.1	5	.216

Note: DIF = Differential Item Functioning; a = discrimination parameter; b = threshold parameter.

### Age measurement invariance

Participants were divided into two age groups by the median (32 years): young adults ( $N = 216$ ) and adults ( $N = 236$ ). We used the latter group as the reference group for DIF analyses. As shown in Table 5, the items did not report significant DIF (from .057 to .991). However, item 1 evidenced DIF on the discrimination parameter ( $p = .045$ ). We then applied the DIF detection procedure, using item 1 as candidate items, and all the other items as anchor items. After this procedure, item 1 did not report significant DIF. Therefore, age measurement invariance was fully accomplished. After testing age invariance, we examined age differences in WOS  $\theta$  scores. Our findings indicated no significant differences ( $t_{(439)} = -0.259, p = .796$ ) between young adults ( $M = -.01, SD = .90$ ) and adults ( $M = .01, SD = .94$ ).

**Table 5.** Differential Item Functioning (DIF) of the WOS items across age (n =441).

Item	aDIF			bDIF		
	$\chi^2$	df	P	$\chi^2$	df	p
WOS1	4.0	1	.046	4.1	5	.531
WOS2	0.0	1	.884	0.3	3	.952
WOS3	0.4	1	.524	0.3	4	.991
WOS4	0.2	1	.667	3.1	5	.692

WOS5	0.1	1	.743	1.8	4	.773
WOS6	0.2	1	.648	2.6	4	.633
WOS7	1.3	1	.259	9.2	4	.057
WOS8	2.8	1	.097	0.2	3	.979
WOS9	0.3	1	.597	2.6	5	.765
WOS10	0.1	1	.796	2.4	5	.790

Note: DIF = Differential Item Functioning; a = discrimination parameter; b = threshold parameter.

## DISCUSSION

Since the first conceptualization provided by Ferris et al. [1], WO has gained high popularity, as this phenomenon may significantly impact several work-related outcomes, such as reduced job satisfaction, job commitment, and job performance [9-13]. Additionally, WO may also have detrimental consequences on workers' psychological health, increasing levels of emotional exhaustion, overtiredness, depression, sleep quality, and feelings of worthlessness [1, 12]. Therefore, relying on psychometrically sound measures for the evaluation of WO is fundamental. Although a substantial body of research exists on this topic, the literature on available instruments for assessing WO remains restricted. Even if the number of studies on this research area is quite large, there is limited literature on available instruments for the assessment of WO: The WOS [1] is unquestionably the most widely used scale, yet studies on its cross-validation and psychometric robustness are lacking. The current study was aimed at cross-validating the WOS on an Italian sample by using an IRT framework.

Our findings indicate that the WOS has a unidimensional structure and that all items reported adequate discriminative power and threshold levels. Specifically, the WOS items showed adequate differentiation in evaluating medium to high levels (about 3 *SD* above the mean) of the construct, and the measure is adequately informative for these levels of the trait.

This means that the scale would be most effective in assessing individuals experiencing higher levels of WO; therefore, it is particularly useful in research and settings where ostracism is more likely to occur (e.g., highly competitive or hierarchical work environments). As the scale is highly informative for individuals perceiving significant WO, it could guide targeted interventions. For instance, organizations could use the scale to identify high-risk employees and then implement specific programs designed to address the social dynamics leading to exclusion or improve coping strategies for those most affected. A scale that is most informative at high levels of ostracism would be particularly helpful in predicting the extreme negative outcomes of WO, such as psychological distress, decreased job satisfaction, and job engagement. On the other hand, our findings suggest caution when interpreting scores at the lower end, and complementary measures might be needed to accurately assess individuals with minimal ostracism experiences.

The investigation of the construct validity of the WOS has revealed significant associations with some work-related variables and psychological outcomes. Specifically, we found that the WOS  $\theta$  scores were negatively associated with job satisfaction, job engagement and its subdimensions (i.e., vigor, dedication, and absorption), and organizational citizenship behaviors (i.e., altruism, civic virtue, and conscientiousness), as well as with life satisfaction. Although the magnitude of these associations is weak, our findings are in line with previous works [1,11,12], reinforcing the notion that WO poses a risk to psychological well-being both within and outside the workplace, and contributes to negative organizational outcomes.

The results from the measurement invariance analysis across gender and age for the WOS items were promising. Regarding gender, we found that the WOS demonstrated minor non-invariance. Specifically, item 1 ("Others ignored you at work") and item 7 ("Others at work shut you out of the conversation") exhibited non-uniform DIF. This indicates that these items discriminate between individuals with the same level of theta differently depending on their gender. From this perspective, it is important to acknowledge that comparisons between scores obtained by males and females should be interpreted with caution: Such comparisons should be approached with the understanding that some differences may stem from the items themselves, rather than from genuine differences in the traits being measured. However, following previous research studies [36,37], maintaining DIF items is a reasonable method when the magnitude of DIF is small and there are few DIF items. When testing gender differences on WOS  $\theta$  scores, we found that men scored significantly higher than women, contrary to previous literature [11].



Further, our results supported the achievement of age measurement invariance. This is a fundamental step for unbiased comparisons of mean scores obtained by two different groups. However, we did not find any statistical differences in WOS  $\theta$  scores between adults and young adults, supporting findings from previous works [11]. Moreover, as workplace ostracism can occur across the lifespan [1], it is expected that WOS scores are unrelated to participants' age.

#### **Limitations and suggestions for future works**

Some limitations should be acknowledged. First, while the use of Prolific was intended to ensure participants' diversity and data quality, its nature as an online platform may have introduced sampling biases. Specifically, it may have led to an overrepresentation of workers with higher levels of digital literacy or those employed in non-traditional settings, potentially underrepresenting individuals in more conventional or digitally excluded sectors. This limits the generalization of the findings to the broader and heterogeneous population of Italian workers.

Second, the cross-sectional design of the study precluded the assessment of the scale's temporal stability and predictive validity. To address this, longitudinal studies are highly recommended. Also, the reliance on self-report measures introduces the potential for social desirability and response biases. Future research should incorporate complementary methods (e.g., behavioral observations, and physiological measures) to reduce these biases and enhance the accuracy of the results.

Given the limited number of cross-validation studies of the WOS, further adaptations of the scale based on robust statistical analytic procedures are needed. Future studies on the WOS should also include measures evaluating other forms of maltreatment or incivility at work, such as harassment, gossiping, and bullying [40–42]. This inclusion would enhance the understanding of the distinctiveness of WO as a specific form of deviant behavior at work [2,11,14].

#### **CONCLUSIONS**

The present study offers a comprehensive examination of the psychometric properties of the Workplace Ostracism Scale (WOS) using an Item Response Theory (IRT) approach. The scale is unidimensional and exhibits adequate levels of reliability and construct validity. Differential Item Functioning (DIF) analysis indicates that the WOS shows minimal gender non-invariance and is invariant across age groups. Given that the WOS is more informative for higher levels of the trait, our findings suggest that it is a robust tool for measuring severe cases of WO, making it particularly valuable in high-risk environments, though potentially less effective in capturing mild or moderate cases.

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## APPENDIX

### WOS Items (Original Version and Italian Adaptation)

1. Others ignored you at work.  
*Gli altri ti ignorano al lavoro*
2. Others left the area when you entered.  
*Al lavoro, gli altri vanno via non appena arrivi*
3. Your greetings have gone unanswered at work.  
*Nessuno ricambia i tuoi saluti al lavoro*
4. You involuntarily sat alone in a crowded lunchroom at work.  
*Rimani involontariamente da solo in una stanza affollata durante la pausa caffè*
5. Others avoided you at work.  
*Gli altri ti evitano al lavoro*
6. You noticed others would not look at you at work.  
*Noti che gli altri non ti guardano al lavoro*
7. Others at work shut you out of the conversation.  
*Gli altri al lavoro ti escludono dalla conversazione*
8. Others refused to talk to you at work.  
*Gli altri si rifiutano di parlare con te al lavoro*
9. Others at work treated you as if you weren't there.  
*Gli altri al lavoro si comportano come se tu non ci fossi*
10. Others at work did not invite you or ask you if you wanted anything when they went out for a coffee break.  
*Gli altri al lavoro non ti invitano o non ti chiedono se vuoi qualcosa durante la pausa caffè*