



The Role of Work Meaningfulness in the Relationship between Workplace Loneliness and Counterproductive Behaviors

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ABSTRACT

This study explores the relationship between workplace loneliness and counterproductive work behaviors, with a focus on the role of work meaningfulness as a moderating factor. In an empirical investigation conducted with a sample of 141 employees from various industries, we examined how perceptions of loneliness influence negative workplace behaviors and how work meaningfulness may diminish this effect. The results indicate that work meaningfulness acts indeed as a moderator in the relationship between loneliness and CWB, and despite the assumption that it would attenuate this relationship, work meaningfulness was found to work as an intensifier. In other words, high levels of perceived meaningfulness may cause a stronger effect of work loneliness on counterproductive work behavior. This study expands and contributes to existing literature regarding the outcomes of meaningful work. Moreover, the research implies that strategies to reduce loneliness and improve work meaning should be carefully designed, as they may have unintended consequences if not balanced properly.

Keywords: loneliness, counterproductive work behavior, meaningfulness

1. INTRODUCTION

Currently, employees face a wide variety of stressors, one of which is quite significant but often neglected: workplace loneliness. Loneliness in the organizational environment can be a phenomenon with significant effects on employee well-being, having the potential to influence counterproductive behaviors that affect both individual performance and organizational atmosphere (Szostek, 2019).

Although this topic appears to be quite important for organizational life, it has been very little studied. Previous studies have shown that workplace loneliness has a significant relationship with social media addiction (Tang et al., 2024) and with counterproductive behaviors in general (Szostek, 2019). However, one aspect that has not been researched is the influence that work meaningfulness has on this relationship. Work meaningfulness is an essential factor in how employees respond to workplace challenges (Steger et al., 2012) and could significantly influence the negative impact of loneliness on deviant behaviors.

The present study aims to investigate the effect of workplace loneliness on counterproductive behaviors, considering work meaningfulness as a moderating factor. It is anticipated that work meaningfulness will reduce the negative impact of loneliness on counterproductive behaviors, thus flattening the effect and promoting a healthy and productive work environment.

This study intends to deepen the understanding of how loneliness and work meaningfulness influence unwanted behaviors at work, as well as to identify ways through which organizations can implement effective strategies to prevent these behaviors.

Workplace Loneliness

Most people have experienced the feeling of loneliness at some point in their lives and are capable of identifying it. The word "loneliness" is often used by people to portray a state of isolation and marginalization of an individual from the rest of the population or to outline the absence of interpersonal relationships with their peers. Researchers sustain that loneliness is people's unsatisfied need for intimacy and the result of deficiencies in their social relationships from a quantitative or qualitative perspective (Peplau & Perlman, 1982).

The Need to Belong Model claim that people have an essential need for meaningful social relationships, and the absence of these connections generates loneliness and negative effects on general health and well-being (Baumeister & Leary, 1995). Loneliness is profoundly associated with feelings of isolation and represents rather a lack of intimate connections than a general lack of social contact. The Evolutionary Theory of Loneliness (ETL) affirms that loneliness has an adaptive role - when we feel lonely, the brain perceives this state as a signal of insufficient social connections, making

us more vigilant toward threats and more suspicious toward others (Cacioppo & Cacioppo, 2018). The Cognitive Discrepancy Model developed by Peplau and Perlman (1982) maintains that loneliness occurs when there is a significant difference between the desired level of social connection and that actually experienced, with a person's perception and expectations playing a central role, not the quantity of relationships (Peplau & Perlman, 1982).

Regardless of the chosen definition, loneliness is a complex system of powerful emotions that arises as a result of unfulfilled intimate and social needs on a psychological level. However, loneliness includes a profound need for connection and emotional closeness and is not limited only to physical isolation (Wright, 2005).

Although specialists have dedicated considerable attention to the concept of loneliness, the study of loneliness's impact on the organizational context remains quite limited. One of the most precise conceptualizations of workplace loneliness was developed by Ozcelik and Barsade (2018), who declare that workplace loneliness is an emotional state defined by the sensation of social isolation or emotional disconnection from colleagues and the organization. Workplace loneliness manifests when employees perceive that their needs for belonging and relationships are not satisfied (Ozcelik & Barsade, 2018). Loneliness is a subjective experience; an employee can feel lonely even if they frequently interact with their colleagues. This happens because the interactions do not reach the minimum level of intimacy, which is subjective (Peplau & Perlman, 1982). This perception can generate feelings of relational inadequacy, leading to psychological pain (Ozcelik & Barsade, 2018; Wright & Silard, 2021).

Researchers vouch that workplace loneliness can be a predictor of many negative consequences in the organizational context. A recent study shows a negative relationship between workplace loneliness and employee well-being (Dhir et al., 2023). Zhang et al. (2024) discovered that workplace loneliness increases the probability that employees will engage in unethical pro-organizational behaviors (UPB) through increased feelings of frustration related to relatedness need thwarting (Zhang et al., 2024). Erdil and Ertosun (2011) studied the influence of organizational social climate on employee loneliness and well-being, based on Weiss's (1973) theory that defines loneliness through two dimensions: social and emotional. The researchers identified two types of social climate: relationship-based climate (cooperation, trust, mutual support) and emotion-based climate (emotional atmosphere - openness and empathy versus cold and distant environment). The results demonstrate that a healthy organizational climate, which combines relational with emotional support, can reduce workplace loneliness and improve employee well-being (Erdil & Ertosun, 2011).

Studies have also discovered that emotional loneliness has a significant and positive relationship with turnover intention in

the organization (Aykan, 2014), and negatively influences people's organizational commitment (Ayazlar & Güzel, 2014). Loneliness decreases performance by reducing positive interactions and employee loyalty toward the organization (Ozcelik & Barsade, 2018). A 2023 meta-analysis identified that workplace loneliness moderately correlates with: low professional performance, reduced job satisfaction, poor quality relationships with managers, and high burnout (Bryan et al., 2023).

In 2022 a study using Self-Determination Theory (SDT) (Deci & Ryan, 2008) demonstrated that workplace loneliness negatively affects employees' emotional engagement, perception of colleague and supervisor support, and reduces organizational citizenship behaviors (OCB) (Wax et al., 2022). Additionally, Tang et al. (2024) discovered that socially isolated employees are more prone to social media addiction and experiencing FoMO (Fear of Missing Out). These findings highlight that loneliness influences employee functioning and well-being.

Work Meaningfulness

Work occupies an important part of people's lives, and many of them desire more than just a simple salary; they want their activity to have a purpose or personal meaning.

"Work meaningfulness" should not be confused with "work meaning" (Rosso et al., 2010), since "meaning" is the result of understanding something, or what it signifies. "Meaningfulness", on the other hand, refers to how important something is to an individual; it consists of how each individual perceives the value and purpose of activities performed at work. Additionally, it involves personal interpretation of the meaning attributed to the work performed and evaluation of how it contributes to fulfilling personal needs, achieving objectives, and satisfying individual aspirations. Work meaningfulness is subjective and can be influenced by each employee's values, beliefs, and motivations (Pratt & Ashforth, 2003).

Work meaningfulness is a eudaimonic, multidimensional psychological state; there are three subdimensions of this purpose-oriented psychological state, which include: (1) Positive Meaning in work (PM): meaningful work is often a subjective experience in which what a person does has personal importance and people judge their work as being important and significant, (2) Meaning making through work (MM): work is an important source of meaning in the total ensemble of human life, contributing to building a broader purpose and personal development, and meaningful work helps people deepen their understanding of themselves and the world around them, (3) Greater good motivations (GG): the desire to have a positive impact on the greater good (Steger et al., 2012).

Lepisto and Pratt (2017) define work meaningfulness starting from two central perspectives: the Realization Perspective and the Justification Perspective. The realization perspective denotes meaningfulness that is centered on fulfilling the individual's needs, motivations, and desires, related to self-

actualization and self-expression; work is considered meaningful when it reflects the person's identity and allows them to realize their potential. The justification perspective focuses on the individual's need to justify the value of their work, answering the question "Why is my work valuable?" Work becomes meaningful when the individual can construct a social or personal justification of its value (Lepisto & Pratt, 2017). Thus, work meaningfulness is seen either as a realization of the self or as a justification of value. This can be caused both by situational particularities (e.g., authentic leadership) of the job as well as internal aspects (e.g., self-efficacy) of the individual (Chaudhary, 2022). For example, involvement in proactive behaviors at work influences the level of meaningfulness that the employee feels independent of the benefits offered by helping others (Fay et al., 2023).

A large part of the literature studying work meaningfulness investigates the relationship between it and job crafting ability. Some studies show that meaningfulness serves as a mediator between job crafting and various positive outcomes within the organization (e.g., work engagement, performance) (Tims et al., 2016; Wrzesniewski et al., 2013).

A job that has meaning for the worker is associated with psychological benefits. Employees who perceive their work as being meaningful or as having a broader social purpose report better psychological adjustment and also display qualities that organizations consider desirable (Dik et al., 2013). People who feel that their work has meaning report a high level of well-being at work (Hager, 2018), and better mental health, contributing to reducing symptoms of anxiety and depression (Steger et al., 2012). They also manifest greater satisfaction regarding the workplace (Choi et al., 2021).

Counterproductive Work Behaviors

Counterproductive work behaviors (CWB) are considered those intentional behaviors that harm the organization or its members (Spector et al., 2006). A detrimental aspect of CWB is the purpose of the action - the act is always intentional and not accidental; therefore, the employee acts consciously with the purpose of harming the organization or may cause collateral damage following an intentional action. These behaviors can manifest as: theft, performing tasks incorrectly, withdrawal, sabotage, aggression (Spector & Fox, 2005).

There are several perspectives on the explanatory mechanisms of counterproductive work behaviors. Robinson and Bennett (1995) developed a typology of deviant workplace behaviors, classifying these behaviors based on two essential dimensions: degree of severity (minor vs. serious deviance) and target of deviant behavior (individual vs. organizational). Based on these dimensions, deviant behaviors are classified into four distinct categories: (1) Production Deviance (Minor and Organizational) - leaving work early, taking excessive breaks, intentionally working at a slow pace, wasting company resources; (2) Property Deviance (Serious and Organizational) - sabotaging equipment, stealing company goods, abusing

expense accounts; (3) Political Deviance (Minor and Interpersonal) - favoritism toward colleagues, gossiping about colleagues, blaming others for one's own mistakes, unconstructive competition; (4) Personal Aggression (Serious and Interpersonal) - sexual harassment, verbal abuse, physical aggression, behaviors that endanger other colleagues (Robinson & Bennett, 1995). This typology provides a clear structure for understanding deviant workplace behaviors and helps organize them into a coherent framework.

Spector and Fox (2005) introduced an explanatory model in the literature: The Stressor-Emotion Model of Counterproductive Work Behavior, building on the Control Theory of the Job Stress Process (Spector, 1998) and the Frustration-Aggression Model (Fox & Spector, 1999). The new model explains these behaviors as results of the interaction between organizational stressors and employees' negative emotional reactions. It suggests that environmental stressors (e.g., interpersonal conflicts, role ambiguity, and excessive workload) lead to negative emotions (e.g., frustration, anger), which subsequently generate counterproductive behaviors. The model suggests that personality traits such as anger and anxiety are important predictors of CWB (Spector & Fox, 2005).

Gruys and Sackett (2003) provide a detailed perspective on the structure of counterproductive work behaviors (CWB). Factor analysis and multidimensional scaling revealed two main dimensions: (1) The Interpersonal-Organizational Dimension (separates behaviors oriented toward the organization from those directed against individuals) and (2) Task Relevance: distinguishes behaviors directly related to work tasks (e.g., poor work quality) from those that are more general in nature (e.g., alcohol consumption). Researchers state that employees who manifest one type of counterproductive behavior are more likely to display other similar behaviors, suggesting the existence of a general pattern whereby these behaviors frequently co-occur (Gruys & Sackett, 2003).

O'Boyle et al. (2012) investigated through meta-analysis the relationship between the Dark Triad and counterproductive behaviors from the perspective of Social Exchange Theory, detecting that people with these traits undermine workplace collaboration by exploiting resources and interpersonal relationships for selfish purposes, negatively affecting performance and organizational behaviors. People with explicit and/or implicit narcissism manifest higher levels of CWB (Fatfouta & Schwarzingler, 2024).

2. METHOD

Research Objectives

The objective of this research is to investigate the effect of workplace loneliness on counterproductive work behaviors (CWB). Additionally, the study explores the moderating effect that the meaning of work may have on this relationship.

Types of counterproductive behaviors differ according to the stressors that cause them: conflicts with supervisors lead to CWB directed toward the organization, while conflicts with colleagues lead to interpersonal CWB, with negative emotions mediating this relationship (Bruk-Lee & Spector, 2006). Among Big Five traits, neuroticism is positively correlated with CWB due to emotional instability, while agreeableness and conscientiousness are negatively correlated (Miao et al., 2023). Personal values such as hedonism and need for power are positively correlated with CWB, motivating counterproductive behaviors to satisfy personal objectives (Muhammad Hafidz, 2012).

Affective changes outside work hours influence CWB; according to Conservation of Resources Theory (COR) (Hobfoll et al., 2018), increased negative affect outside work consumes emotional resources and reduces self-control capacity (Qu et al., 2021). Also, perceived organizational injustice triggers negative emotions that motivate revenge through counterproductive behaviors, amplified by lack of support or poor relationships with leaders (El Akremi et al., 2010). Szostek (2019) shows that low-quality interpersonal relationships are associated with increased stress and conflicts, leading to behaviors such as sabotage, theft, or colleague harassment, but very close relationships can also increase CWB through group negligence or sabotage out of solidarity with a colleague treated unfairly by the organization (Szostek, 2019).

Workplace loneliness represents a factor with significant negative implications, being associated with increased counterproductive behaviors (Szostek, 2019), affecting employee well-being and organizational performance (Bryan et al., 2023; Ozelik & Barsade, 2018). Work meaningfulness can act as a protective factor, reducing the negative impact of loneliness by providing meaning to professional activities. Although the effect of work meaningfulness is researched in relation to well-being and satisfaction, there is no vast empirical support for its relationship with other organizational factors. This study creates a "bridge" between workplace loneliness and work meaningfulness, supporting that there is a significant relationship between workplace loneliness and counterproductive behaviors, and work meaningfulness can serve as a moderator in this relationship.

Hypotheses

H1. *The meaning of work has a significant negative moderating effect on the relationship between loneliness and CWB.*

Participants and procedure

The eligibility criterion for inclusion and exclusion was the age of the participants; this study addresses only individuals over the age of 18. Furthermore, in order to participate in the study, individuals were required to be employed.

Participants were invited to complete the questionnaire via the Google Forms platform. They were selected using the snowball sampling method and contacted through social media platforms (e.g., Instagram, WhatsApp, or Messenger). Respondents were asked to sign an informed consent form regarding the processing and use of personal data. They were also informed that they could withdraw from the study at any time.

The questionnaire had several sections that participants were required to complete. The first part involved reading and providing informed consent, as well as entering demographic data. For demographic data collection, participants answered a series of questions. To indicate place of residence, they selected either "Rural" (coded as 1) or "Urban" (coded as 2). Regarding gender, participants chose "Male" (1) or "Female" (2). Educational level was reported according to the following classification: "Primary" (1), "Middle school" (2), "High school" (3), "Post-secondary" (4), "Bachelor's degree" (5), "Master's degree" (6), "Doctorate" (7), and "Postdoctoral" (8). Participants also indicated the average number of hours dedicated to work activities per day, selecting from the following intervals: "0–2 hours" (1), "2–4 hours" (2), "4–6 hours" (3), "6–8 hours" (4), "8–10 hours" (5), and "more than 10 hours" (6). Once all responses were completed, the data were collected and entered into a statistical database, using the coding described above to facilitate further analysis.

The second part of the questionnaire consisted of completing the Loneliness at Work Scale (LAWS) (Wright et al., 2006), followed by the Counterproductive Work Behavior Checklist (CWB-C) (Spector et al., 2006), and finally the Work and Meaning Inventory (WAMI) (Steger et al., 2012).

A total of 141 individuals participated in the study. Of the 141 participants, 52 (36.9%) were men and 89 (63.1%) were women. The mean value of gender is $M = 1.63$ ($SD = .48$), indicating a distribution closer to value 2 (Female). The age of the participants ranged from 18 to 55 years. The average age of participants is 26.01 years ($SD = 7.69$), with a median age of 23, suggesting a slightly skewed distribution due to a few older participants who influenced the mean. 48 (34%) of the participants came from rural areas, and 93 (66%) came from urban areas. The mean value for place of residence is 1.66 ($SD = .47$), indicating a distribution leaning toward value 2 (Urban), which shows that the majority of participants came from urban areas. Their education levels were as follows: high school graduates (44.7%), bachelor's degree (27.7%), master's degree (19.1%), and other (8.5%). The mean level of education is 4.18 ($SD = 1.31$), and the median is 4, suggesting that most participants have completed post-secondary education. The

mean number of working hours is 3.87, with a median of 4, indicating that most participants fall within the 4–6 hours per day work interval.

Sample Size

Before collecting responses, an a priori power analysis was conducted to determine the required sample size. Based on $f^2 = 0.08$, $\alpha = .05$, and $1 - \beta = 0.80$, the analysis indicated 141 participants were needed. The effect size of 0.08 was set by the researcher due to lack of similar studies in existing literature, chosen to balance practicality while avoiding overestimation of variable relationships.

Instruments

Loneliness at work was measured with Loneliness at Work Scale (LAWS) to measure the level of workplace loneliness experienced by participants. The LAWS scale consists of 16 items. Responses are measured on a 5-point Likert scale (1 = Strongly disagree, 5 = Strongly agree), indicating the extent to which participants agree with statements such as: "I often feel alienated from my coworkers". Statistical analyses indicate the presence of two facets: (1) Emotional Deprivation (ED), (2) Social Companionship (SC). The psychometric properties of the LAWS subscales show a Cronbach's alpha index above .80, with α values ranging between .87 and .93 (Wright et al., 2006).

Counterproductive behavior was measured with The Counterproductive Work Behavior Checklist (CWB-C) to identify the frequency of counterproductive behaviors in the workplace. The CWB-C scale consists of 45 items. Responses are measured on a 5-point Likert scale (1 = Never; 5 = Daily), indicating how frequently counterproductive behaviors occur, with questions such as: "Have you arrived late to work without permission?". The scale includes two facets: (1) CWB directed toward the organization (CWB-O) and (2) CWB directed toward individuals (CWB-I). The subscales of the CWB-C show Cronbach's alpha values above .80, ranging between .84 and .85 (Spector et al., 2006).

Work meaning was measured with The Work and Meaning Inventory (WAMI) to assess the meaning that respondents attribute to their work. The WAMI scale consists of 10 items. Responses are measured on a 5-point Likert scale (1 = Strongly disagree, 5 = Strongly agree), indicating the extent to which participants identify with the provided statements, such as: "I have found a meaningful career". The scale measures three facets: (1) Positive Meaning (PM), (2) Meaning-Making through Work (MM), and (3) Greater Good Motivations (GG). The WAMI subscales have Cronbach's alpha values above .60, ranging from .65 to .78 (Steger et al., 2012).

Research Design

This study has a cross-sectional correlational design.

3. RESULTS

Descriptive Statistics

The data was analyzed using R Studio, with the dataset imported from Excel. First, the internal consistency of each

questionnaire was verified: LAWS (.91), CWB-C (.95), and WAMI (.94); thus, all questionnaires showed very high internal consistency. The next step was to compute descriptive statistics.

Table 1

Descriptive statistics and Spearman correlation matrix

	M	SD	α	1	2	3	4	5	6	7	8	9	10
1. LAWS	35.1	13.3	.91	—									
2. ED	19.4	7.93	.89	.89***	—								
3. SC	15.7	7.14	.88	.88***	.60***	—							
4. CWB-C	64.7	19.3	.95	.32***	.36***	.02*	—						
5. CWB-O	34	9.74	.88	.35***	.38***	.24**	.91***	—					
6. CWB-P	30.7	10.94	.94	.18*	.22**	.08	.82***	.57***	—				
7. WAMI	37.4	10.76	.94	-.59***	-.50***	-.53***	-.34***	-.36***	-.18*	—			
8. PM	14.8	4.78	.92	-.57***	-.48***	-.53***	-.32***	-.35***	-.17*	.94***	—		
9. MM	11.3	3.54	.88	-.58***	-.48***	-.54***	-.32***	-.36***	-.15	.93***	.84***	—	
10. GG	11.3	3.22	.72	-.51***	-.47***	-.43***	-.27***	-.27***	-.16	.89***	.75***	.76***	—

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

In Table 1, descriptive analyses of the measured variables and the facets of each were conducted. Independent Variable: Loneliness (M = 35.1, SD = 13.3) and its facets: Emotional Deprivation (ED, M = 19.4, SD = 7.93) and Social Companionship (SC, M = 15.7, SD = 7.14). Dependent Variable: Counterproductive Work Behaviors (CWB, M = 64.7, SD = 19.30) and its facets: CWB directed at the Organization (CWB-O, M = 34.0, SD = 9.74) and CWB directed at Individuals (CWB-I, M = 30.7, SD = 10.94). Moderator: Meaning of Work (M = 37.4, SD = 10.76) with the facets of Positive Meaning (PM, M = 14.8, SD = 4.78), Meaning-Making through Work (MM, M = 11.3, SD = 3.54), and Greater Good Motivations (GG, M = 11.3, SD = 3.22). The distribution of the data for the CWB variable is skewed (Skewness = 3.67). Furthermore, the distribution does not meet the normality assumptions (Kurtosis = 21.41). Based on these indicators, it was decided that non-parametric statistical procedures would be used to test the hypothesis, as the data do not meet the condition of normality. Workplace loneliness, as measured by the LAWS scale, was significantly positively correlated with overall counterproductive work behavior ($r = .32$, $p < .001$), as well as with counterproductive

behavior directed at the organization ($r = .35$, $p < .001$) and at people ($r = .18$, $p < .05$). This suggests that higher levels of loneliness at work are associated with more frequent engagement in harmful work behaviors. Conversely, loneliness was significantly negatively correlated with perceived meaningfulness of work ($r = -.59$, $p < .001$), including all three WAMI dimensions: Positive Meaning ($r = -.57$, $p < .001$), Meaning-Making through work ($r = -.58$, $p < .001$), and Greater Good motivations ($r = -.51$, $p < .001$). In line with expectations, work meaningfulness also exhibited significant negative correlations with counterproductive work behaviors. The overall WAMI score was inversely related to CWB-C ($r = -.50$, $p < .001$), CWB-O ($r = -.53$, $p < .001$), and CWB-P ($r = -.36$, $p < .001$), indicating that individuals who perceive their work as more meaningful are less likely to engage in such behaviors.

Hypotheses testing

To test the research hypothesis, a Robust Regression Model was used. The first step was to center the data (Loneliness and Meaning). Then, robust regression was applied to examine the relationship between the variables, which is presented in Table 2..

Table 2*Robust regression model*

Effect	Estimate	SD	95% CI		t	p
			LL	UL		
Intercept	63.37	1.15	61.09	65.64	55.06	<.001
Loneliness centered	.14	.09	-.04	.33	1.54	.12
Work meaningfulness centered	-.33	.12	-.58	-.09	-2.74	<.01
Loneliness centered x Work Meaningfulness centered	.01	.01	.00	.02	2.14	.03*

Note: * $p < .05$, ** $p < .01$, *** $p < .001$.

The coefficient associated with Centered Loneliness = .14 (SD = .09), although the sign of the coefficient indicates a positive relationship between Centered Loneliness and CWB, this relationship is not statistically significant ($t = 1.54$, $p > .05$). The coefficient associated with Centered Meaning = -.33 (SD = .12), this coefficient is statistically significant ($t = -2.75$, $p < .01$), indicating a negative relationship between Centered Meaning and CWB. Thus, an increase in Centered Meaning is associated with a decrease in the CWB score. The interaction between Centered Loneliness and Centered Meaning = .01 (SD = .01), this effect is statistically significant ($t = 2.14$, $p < .05$), suggesting that the relationship between Centered Loneliness and CWB varies depending on the level of Centered Meaning. The positive coefficient indicates that an increase in Centered Meaning amplifies the positive effect of Centered Loneliness on CWB. Therefore, Centered Meaning has a negative moderating effect in the relationship between Centered Loneliness and Counterproductive Work Behaviors, and thus, we reject H1. The standard errors for the coefficients indicate the precision of the estimates. The root mean square error of the residuals (11.01) suggests the dispersion of the predictions from the observed values.

We applied the Mann-Whitney U Test (Wilcoxon rank-sum test) to compare counterproductive work behaviors between sex groups (female, male). Following the test, we found that there is a significant difference between the two groups ($W = 2866$, $p = .01$, $p < .05$), suggesting that sex has a significant effect on counterproductive behaviors.

The Kruskal-Wallis Test was applied to compare counterproductive work behaviors among several groups defined by Education. The test suggests that there are significant differences between the education groups regarding counterproductive behaviors ($\chi^2 = 12.80$, $df = 6$, $p = .04$, $p < .05$). In other words, the distribution of counterproductive work behaviors differs significantly depending on participants' level of education.

To examine the relationship between loneliness (centered) and counterproductive work behaviors, we used Spearman's Correlation. The results of the Spearman test ($\rho = .32$, $p < .001$) indicate that there is a moderate and statistically significant positive correlation between centered loneliness and counterproductive work behaviors. This suggests that people who experience higher levels of loneliness tend to display counterproductive work behaviors more frequently.

Table 3*Generalized regression between centered loneliness, centered work meaning, and counterproductive behaviors*

Predictor	β	SD	t	95% CI		p
				LL	UL	
Intercept	64.67	1.58	40.85	61.55	67.79	< .001
Loneliness (centered)	.28	.15	1.79	-.03	.58	.07
Work Meaningfulness (centered)	-.16	.19	-.85	-.53	.21	.39

Note: * $p < .05$, ** $p < .01$, *** $p < .001$.

The Generalized Linear Model (GLM) investigated the relationship between centered loneliness, centered

meaningfulness of work, and counterproductive work behaviors. In the case of centered loneliness, the coefficient was estimated

at .27, suggesting a positive relationship with counterproductive behaviors. However, this relationship is not significant ($p = .07$, $p > .05$). This result indicates a possible marginal link between the two variables, suggesting that loneliness might contribute to counterproductive behaviors, but not in a strong enough manner to be confirmed in this model. Centered meaning of work had a negative coefficient of $-.16$, suggesting a possible inverse relationship with counterproductive behaviors, but it was not statistically significant ($p = .39$, $p > .05$). The model's intercept, with a value of 64.67 ($p < .001$), reflects the average level of counterproductive work behaviors when both loneliness and meaning of work are at their centered mean level (zero). Thus,

5. DISCUSSIONS

The aim of this study was to understand the relationship between loneliness, work meaningfulness, and counterproductive work behaviors (CWB). The results highlight that the interaction between loneliness and work meaningfulness significantly influences the occurrence of CWB, with a higher level of work meaningfulness strengthening the effect of loneliness on counterproductive behaviors. This counterintuitive relationship can be explained by the Effort-Reward Imbalance Model (ERI) (Siegrist, 2016), which states that people need a balance between the effort invested at work and the rewards received. Work meaning is perceived as the effort given to the organization, while loneliness represents the reward received. Experiencing an imbalance between high effort (meaningfulness) and low reward (loneliness/weak social relationships) frustrates expectations of equivalence and can predict counterproductive behaviors. Babamiri et al. (2022) assert that ERI predicts CWB-I when employees feel their effort is not adequately rewarded. These results provide the first direct demonstration of the relationship between loneliness, work meaning, and counterproductive behaviors, suggesting that individuals who feel lonely at work are more likely to engage in CWB if they perceive high work meaning, as their effort is not reciprocated with the desired social relationships. However, this explanation is inductive reasoning and requires rigorous studies to clarify the mechanism through which work meaning stimulates CWB among lonely individuals in the organizational context.

The results show that loneliness has a positive effect on counterproductive behaviors, indicating that employees who feel isolated are more likely to exhibit attitudes and actions that negatively impact the organizational climate, according to Spearman's correlation. These findings are consistent with previous studies showing that loneliness at work contributes to the emergence of counterproductive behaviors (Hitlan & Noel, 2009). Yet, Robust Regression reveals that the relationship between loneliness and CWB is not statistically significant.

in the absence of variation in these factors, counterproductive work behaviors remain at a relatively high level. The results can be seen in Table 3.

The kernel regression model was applied to analyze the nonlinear relationships between the centered loneliness and centered work meaning variables with counterproductive work behaviors. The kernel model result does not provide an easily interpretable coefficient but can be used to identify complex relationships among the variables in the data. Two-dimensional (2D) and three-dimensional (3D) visualizations were used to illustrate the relationship between centered loneliness, centered work meaning, and counterproductive work behaviors.

Future research should analyze in more detail the impact of loneliness on deviant behaviors to better understand this relationship.

An important aspect is the impact of work meaningfulness, which has a significant negative effect on counterproductive behaviors. In other words, employees who perceive their work as purposeful and personally valuable are less likely to adopt behaviors harmful to the organization or colleagues. This suggests that a sense of work meaning plays a protective role, contributing to engagement and professional responsibility. However, previous studies support an indirect relationship between work meaning and CWB (Long, 2017; Sirbu et al., 2023).

Additionally, the Mann-Whitney U test reveals that sex differences influence significantly counterproductive behaviors. These results are supported by earlier studies where sex plays a moderating role between factors and CWB; researchers found sex differences in the occurrence of CWB, especially that males tend to engage more in counterproductive behaviors (Lipińska-Grobelny, 2021; Spector & Zhou, 2013; Szostek et al., 2022). The Kruskal-Wallis test showed that education level has an important impact on counterproductive behaviors, suggesting that employees with higher education may better understand the consequences of such behaviors and develop more effective strategies for managing conflicts and professional pressure. Appelbaum et al. (2007) state that highly educated individuals are less likely to engage in deviant behaviors.

These findings have important implications for organizations and human resource management. To reduce counterproductive behaviors, employers should implement strategies that combat loneliness by encouraging social interactions (team-building, mentoring, informal meetings), adapt support as the work environment evolves (individual discussions focused on wellbeing and work-life balance), and develop a people-oriented organizational culture (Sullivan & Bendell, 2023). It is essential to facilitate resources to increase work meaning through three steps: using personal strengths, linking activities to meaningful outcomes, and contributing to a greater good (Dik et al., 2013). These steps provide satisfaction

by leveraging skills, connecting work to long-term goals, and fostering altruism.

Finally, individual factors such as sex and education should be integrated into management strategies to adapt organizational policies to employee diversity.

Theoretical and Practical Implications

This study contributes to the literature by offering new perspectives on the relationship between loneliness and work meaningfulness, emphasizing the importance of this relationship in amplifying negative behaviors in the workplace. Additionally, the study strengthens existing theories about psychological resources and their impact on organizational behaviors. This finding makes a significant contribution to psychological resource theories, supporting the idea that, under certain conditions, resources traditionally considered beneficial can paradoxically act as risk factors and exacerbate negative consequences in organizational contexts (Winkel et al., 2011).

In practical terms, the study offers new insights for developing organizational strategies aimed at combating counterproductive work behaviors. Organizations should pay special attention to the loneliness experienced by employees, especially those who perceive their work as highly meaningful. Interventions focusing solely on increasing work meaningfulness may be insufficient or even counterproductive if not accompanied by measures aimed at improving social connections in the workplace. Thus, strategies aimed at reducing loneliness and enhancing work meaningfulness could have a significant impact on reducing CWB if both variables are considered.

This theoretical framework highlights the importance of a work environment that fosters both social connections and the development of a sense of professional purpose.

Limitations and Future Directions

There are at least three important limitations regarding the results of this study. The first limit regards the scales extracted from Research Central. The Workplace Loneliness Scale (LAWS) presents validity issues, as it was not compared with other similar instruments due to the lack of alternative scales at the time of its development. The sample used is limited and

does not reflect the diversity of industries and hierarchical levels, and testing in specific contexts (certain country, educational level) raises questions about global applicability (Wright et al., 2006). The Counterproductive Work Behavior Questionnaire (CWB-C) has limited generalizability, being mostly tested on employed students, which calls into question its applicability to other professional categories. The authors acknowledge this limitation and recommend further studies on diversified professional groups (Spector et al., 2006). The Work and Meaning Inventory (WAMI) shows representativeness issues, having been validated on a single sample from a university organization. Validation is lacking in different organizational environments (corporations, NGOs, public sector), raising questions about functionality in non-academic sectors (Steger et al., 2012). Future research would benefit from applying more rigorous measurement tools to provide a more accurate representation of the phenomena analyzed.

The second limitation concerns the sampling method. The questionnaire was distributed through snowball sampling, resulting in low population generalizability. Participants were selected based on the social networks of initial participants, meaning the sample is not random, and employee groups less socially connected or less open about loneliness may be underrepresented. Future research is recommended to diversify the sample by using selection methods that minimize possible biases.

The third limitation is that participants completed self-reported questionnaires, which can influence the collected data since employees' perceived responses may differ from reality.

Conclusions

In conclusion, the study highlights that both individual factors (gender and education) and psychological factors (loneliness and work meaningfulness) play essential roles in the emergence of counterproductive work behaviors. By addressing these aspects, organizations can create a more positive work environment, reducing employees' tendency to engage in such behaviors and improving professional performance and satisfaction.

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