Research article

Evidence of validity and reliability of the controlling motivational style questionnaire in the work context

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ABSTRACT

According to the self-determination theory (SDT), leaders may adopt a controlling motivational controlling style (CMS) that forces employees to think, feel, or behave in a certain way to promote employee motivation. However, a scale has yet to be developed to measure CMS in the work environment. Usually, researchers use questionnaires adapted to different contexts or designed for another motivational style. However, whether these questionnaires capture the behaviors that represent CMS in the work context is little known. This research aimed to elaborate on and analyze the validity and reliability of the questionnaire on Controlling Motivational Style at Work (CMS-W). The study was based on a literature review of the types of controlling behaviors and a review of questionnaires used by SDT researchers who assessed the controlling motivational style in different contexts. A Peruvian sample of 1100 public sector employees participated. The results show that the short and encompassing CMS-W-11 has a one-dimensional structure with good fit indices: Robust RMSEA = 0.071 with 90 % CI from 0.064 to 0.078; Robust CFI = 0.975; Robust TLI = 0.969; SRMR = 0.025 and good reliability coefficients: Ω = 0.930 and AVE 0.630. Furthermore, it shows convergent validity with controlled motivation (r = 0.260, p < .001) and discriminant validity with autonomous motivation (r = −0.270, p < .001). Moreover, the invariance of the gender category was tested. The fit indices were adequate, and the comparative results between the models were also satisfactory. In addition, the behaviors of the CMS in a work context are conditional negative regard, judging and devaluing, control through objectives, intimidation, and intrusive authority. Therefore, labor organizations will have the CMS-W validated and tested in a work context to evaluate the CMS of leaders and study how it related to the motivation of human capital and organizational objectives.

1. Introduction

Organizations are oriented toward achieving their goals [1]. However, looking for more productivity and efficiency can lead leaders to be more instrumental in using resources and adopt an impersonal interaction model, leaving employees with almost no options other than complying with the goals [2]. However, the optimal use of resources and opportunities will only lead to success with the timely participation of people [1]. Therefore, it is important that a leader adopts a more integrated management style and displays

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motivational, interpersonal behaviors in how he communicates his strategies [3]. The management or leadership style is believed to be a determining factor of the organization's success because it directly or indirectly impacts employees' attitudes and work results, such as motivation [4].

The management style (motivational or leadership style) is how the leader interacts with the employees to influence, coordinate, direct, and motivate them to achieve their best performance, well-being, or positive attitudes [5,6]. Even though many leadership theories exist, a differentiation can be made between a people-oriented and change-oriented style versus a task-oriented style [7].

The people-oriented style promotes positive interpersonal relationships and is a way to help and show concern for your employees [8,9]. In addition, people-oriented leaders are vital in motivating employees [10] because leaders know that motivation is a potential strategic lever that supports value-creation processes and promotes activities that enable employees to achieve objectives [11,12]. Some of the people-oriented styles are effective leadership [13]; servant leadership [14]; commitment leadership [15]; or transformational and transactional leadership [16]. They all refer to an interpersonal style, which can be highly motivating. However, another line of research comes from the Self-Determination Theory [17], which clearly defines a motivational leadership style that leaders can use with motivating effects on employees, for example, autonomy support or control, which are helpful for truly assessing the motivating potential of leaders [18].

Self-Determination Theory [17] is one of the leading frameworks that explain motivation in different contexts, like work contexts. SDT is an empirically based theory of human motivation, development, and wellness based on satisfying basic psychological needs for autonomy, competence, and relatedness. When psychological needs are satisfied, employees have optimal functioning and performance [19–21].

SDT distinguishes two types of motivation, autonomous and controlled. Autonomous motivation is characterized by an employee's full participation and the possibility to choose to carry out activities that sustainably generate much value for an organization [20]. In contrast, controlled motivation characterizes employees who act to obtain rewards, avoid punishment, or engage in activities due to internal pressure [22]. Controlled motivation may help employees to achieve results in the short term but may reduce efforts and cause harmful spillover effects on performance in a long time and be detrimental to well-being [23].

A crucial aspect of the SDT is that the social context environment, or general climate in a classroom, sports center, or workplace, is assumed to influence the perception of support, criticism, or pressure. For example, in the work context, an interpersonal relationship is formed that is characterized by the orientations, intentions, or behaviors of a person who occupies a position of authority, such as the leader, with another person in charge, such as an employee [24–26]. Other examples are the teacher and the student, the coach and the athlete, or the father and the son, among others.

According to SDT, this can manifest in two motivational styles applied to management: autonomy support or control. The autonomy-supporting style (AS) refers to a group of behaviors that acknowledge the employee's perspectives, offer opportunities for choice, and provide empathy and positive feedback [5,18,19]. An autonomy-supportive style satisfies basic psychological needs [27] and promotes autonomous motivation toward better levels of job satisfaction and performance [28], innovation and creativity [29], or productivity [30].

By contrast, a controlling motivational style (CMS) is defined as prescriptive and rigid; it pressures employees to think, feel, or behave in a particular way [17]. For example, leaders threaten with a coercive or punitive action if they fail to achieve results according to the dictated guidelines, when the views of employees are not considered when imperative language is used to persuade them to act, and when rewards or punishments are used to achieve certain behaviors [27,31].

Several studies in a work context associate a CMS with controlled motivation like ethics disruption [32], exhaustion [33], affects well-being [34], affects work commitment [35], or hinders creativity work [36].

Thus, research related to CMS requires the attention of researchers to learn how it relates to organizational behavior. However, autonomy support is well-studied in the context of work, as well as in other contexts [27,37,38]. There is only a limited set of studies on CMS, albeit the number of studies on CMS in the workplace is growing [31,39–44]. Although the results of these investigations are varied, they all point to the negative effect of CMS on the autonomous motivation, resources, and well-being of employees.

However, there is less agreement regarding in the measure of a controlling motivational style: researchers have used and adapted different measures from other domains, such as education, parenting, or sports [45–53]. For example, to cite some of the research, Kanat-Maymon et al. [39,41] used the Perceived Parental Autonomy Support Scale adapted to the work context [47]; Thomas et al. [40] and Halvari et al. [43]used Scale of Psychological Control of the Teacher [49]; Sarmah et al. [31] and Zhang et al. [44] used the Psychological Control Scale - Youth Self-Assessment [45] and Sullivan et al. [54] used the Controlling Coach Behavior Scale [46]. However, Bartholomew et al. [55] reported that the development of the controlling behavior typologies based on other contexts "should be done with caution" [55], even when teachers and coaches have a position of authority over students and athletes, such as relationship Is qualitatively much different from that between leaders and their employees.

Other researchers used scales developed to study autonomy support [56] to measure CMS. Researchers have long assumed that the two motivational styles lie at opposite ends of the same continuum, supporting or frustrating the satisfaction of a person's basic psychological needs and autonomous motivation [22]. Therefore, under this premise, a low autonomy supportive style represents a high controlling style [57]. Two of the most used questionnaires under this approach are: "Problems at Work" by Deci et al. [30] and the "Work Climate Questionnaire" by Baard et al. [19]. The latter questionnaire continues to be widely used to measure autonomy support. However, recent developments have identified a slightly negative relationship between autonomy support and controlling styles [58,59]. These findings allowed for a new interpretation that "the absence of autonomy support is not necessarily the presence of control …; as well as the absence of control … is not necessarily the presence of autonomy support" [58] or that the lack of "support for autonomy does not automatically imply that one acts in a controlling manner [and vice versa]" [59].

Thus, adapting other measures and using scales developed to study autonomy support to assess CMS may hamper the systematic

and valid growth of the literature on CMS. Therefore, it is important to revise the literature to develop an instrument specifically to evaluate CMS in a work context and thus identify the leaders of the motivational style used with their employees. Based on a review of the literature and the existing instruments, this study aims to develop a questionnaire of CMS that can be used consistently to measure the controlling motivational style of a leader in a work context.

The main aim of this research was to elaborate and analyze the validity and reliability of a questionnaire on Controlling Motivational Style at Work (CMS-W) to arrive at a valid and reliable questionnaire to assess an employee's perception of the leader's controlling motivational style (CMS) in a work context from the SDT perspective.

Additional aims were to understand leader controlling behaviors in the workplace to shed light on how the leader emphasizes using strategies or techniques, such as intimidation or control through objectives, to improve performance or thwart motivation or the basic psychological needs of workers [19,22,27]. Furthermore, the study of the questionnaires used to evaluate CMS in different contexts according to SDT made it possible to identify the controlling behaviors that characterize a leader in a work context.

The leadership style, like the controlling style according to SDT, is important variable in social organizations, such as workplaces, because the growth and efficiency of the organizations will largely depend on it. Therefore, work organizations need to pay considerable attention to this aspect, and it is essential to know how to evaluate the leader's controlling style to determine its advantages and limitations. Based on this knowledge, work organizations will be able to study other leadership styles, besides the autonomy-supporting style, which is more studied in the organizational context.

In the future, having a robust workplace questionnaire will provide accuracy and efficiency well established within SDT supported by empirical evidence. The progress of the CMS study, especially as we further explore the motivational relationships between leaders and workers, depends on the validity of the measurement. This would further strengthen clarity on CMS and facilitate the growth of literature on the matter.

To this end, we reviewed and adapted the items according to the theoretical categories that best represent the controlling motivational style at work. Then we reviewed the proposed items from well-studied questionnaires. The purpose was that the items capture the essence of the theoretical categories. The items were obtained from a literature review on controlling behaviors and instruments with evidence of validity and reliability to assess the CMS in different contexts [45–48].

The search was done in the Scopus, Web of Science, and Google Scholar databases. Initially, the review fell on the work context, but it was decided to broaden other contexts, such as education, sports, health, or parenting. We then analyzed the construct validity through evidence of convergent and discriminant validity [60]. Next, autonomous, and controlled motivation were used to analyze the correlation of the CMS-W with these constructs [61]. The CMS-W was expected to have convergent validity with controlled motivation (positively correlated) and discriminant validity with autonomous motivation (negatively correlated) [22,27,61]. We furthermore analyzed through the study of invariance whether the CMS-W items have the same meaning for different subgroups of participants [62]. The factorial structure of the CMS-W was analyzed based on gender and the organization category where the participants work.

This study adds to the existing but not extensive literature investigating CMS in an employment context. However, the main contribution of the present study is to make available to researchers an instrument to investigate CMS in a work context, in line with recent developments [58,63] showing that the autonomy support style is different from the controller style and requires separate measurements. Our CMS-W will allow more frequent scale use in future employment investigations. Secondly, the practical contribution of identifying the controlling behaviors of the leader in a work context is essential to help organizations improve human resources practices, identify the controlling motivational style of leaders, and to help them improve the context labor. Third and last, most studies developing scales in psychology are based on an existing scale [64]. Our study has an outstanding theoretical contribution because eight existing CMS scales in different contexts were reviewed and combined to obtain CMS-W-11. For this reason, our study is unique in its theoretical contribution.

2. Literature review

2.1. Review of types of controlling behaviors in different contexts

According to SDT, it is proposed in the present study that the controlling motivational style (CMS) in the work field is the leader's behavior comprised of external factors relating to an "if-then" exchange so that employees emphasize the contingency of rewards and sanctions in performance. It includes methods, strategies, or techniques used by a person with CMS to influence a people's behavior, motivation, or frustrating basic psychological needs [39,59]. For example, high-pressure environments, such as sports or work, may force coaches/leaders to control various behaviors with their athletes/employees to meet demands [32,65,66]. On the other hand, like teachers, leaders may choose CMS to see themselves as more valued and competent [67]. Based on the review of the literature, a taxonomy of seven representative controlling behaviors and the characteristics associated with each one can be extracted, which can possibly also manifest in the work context.

The first behavior is the use of tangible or verbal rewards, such as monetary payments, gifts, or praise, which reward employees' performance, motivate them to achieve goals, and improve the productivity and efficiency of organizations [68,69]. However, rewards can have different meanings depending on how they are perceived by employees [70]. Although rewards are considered positive for enhancing performance, when used to report improvements [71], they gain a sense of control when they are presented as restrictive and oppressive to task performance or when they demand a certain level of performance, weakening motivation autonomous [30,46, 72].

Thibault-Landry et al. [70,73] have empirically argued that controlling monetary rewards have a negative psychological effect on employees, such as feeling pressured and coerced to behave in a certain way, leading to suboptimal functioning. In a Canadian context,

other research by Thibault-Landry et al. [74] highlighted the functional value of rewards beyond the reward itself, which can lead employees to focus on rewards and care little about the quality of work. In addition, rewards can generate hidden labor costs such as performing tasks dishonestly [75], completing tasks without the required standards [76], lowering the quality of services [77], or affecting job satisfaction or organizational performance [78].

Verbal rewards, such as public recognition given by the leader for better performance, can also have a controlling effect and can diminish the autonomous motivation of employees [79]. However, verbal rewards are less likely to cause adverse effects than tangible ones [80]. Despite this, the controlling aspects can apply to all rewards, including the verbal ones; therefore, we would expect that verbal rewards administered in a controlling way would undermine intrinsic motivation.

The second controlling behavior is conditional negative regard, which relies on contingent reinforcement, attention, or affect to condition a person's behavior and traits [81]. Employees would be willing to lose their voice and give up their autonomy in exchange for the leader's approval and recognition [81]. As it happens in parental contexts, leaders can withhold their affection and esteem when employees do not achieve the expected work performance or do not do what leaders demand; however, they would offer their support or assistance when employees comply with predetermined tasks [81–83]. Leaders will distance themselves emotionally and physically from employees, much like coaches/teachers, with their athletes/students if employees perform poorly or do not meet the goal [65,84,85].

Assor et al. [81] suggest that the conditional negative regard promoted by parents toward children can promote desired behaviors but affects children's self-esteem, and disapproval and resentment of parents arise. In the workplace, this could lead to counterproductive behaviors [86]. Furthermore, a meta-analysis [87] reports that conditional negative regard is significantly and positively associated with depressive symptoms. In the workplace, such behavior thus could cause considerable economic costs due to the absence of employees due to illness or high turnover [88].

Intimidation is the third controlling behavior. It includes verbal abuse, yelling, or launching personal attacks to humiliate and belittle someone [55]. For example, leaders undermine the bond with their employees when they shriek at them to do what they want, which causes them to feel shame, guilt, and fear [67,89,90]. If coaches yell at their athletes for results in competitive seasons, leaders could similarly intimidate their employees in demanding work circumstances [84,91].

The constant and persistent pressure of leaders on employees, such as parents with their children, with the use of expressions such as "everyone should be able to do this job, even a child could do it," will lead to actions to avoid embarrassment, disapproval from co-employees or unfavorable comparisons [92,93]. Research by Morbée et al. [65] and Goffena and Horn [94] report similar results that intimidation behaviors undermine employees' autonomy to a greater degree than rewards or conditional negative regard.

Judging and devaluing feedback, the fourth controlling behavior is a way of evaluating and pressuring an employee to achieve a certain level of performance. Even so, it undermines motivation and performance [95,96]. In addition, leaders who judge and devalue the contribution and effort of their employees send a message that diminishes their authority, affecting the self-efficacy of their employees [97]. Leaders also do not accept criticism from their employees; if they do, they issue arbitrary statements; and show little esteem and appreciation for employees [39]. In other cases, leaders may improperly judge employees for poor performance or arbitrarily exclude them from their assignments [98].

Judging and devaluing behaviors are used in labor organizations that seek to control the behavior of employees and maintain superiority by making it clear that he is the boss [30]. The research by Ronen and Donia [99] refers that leaders that use hostile language will affect the autonomous motivation of the employees; that is, employees will experience work as less exciting and less aligned with personal goals.

The fifth controlling behavior is control through objectives, which refers to the orders issued by the leaders for employees to carry out tasks that will be verified if they were done as ordered [30,100]. It is considered a relatively invariant characteristic in work contexts. However, it can lead leaders to threaten employees with terms such as: "The renewal of the contract will depend on achieving the objectives." [101]. When employees perceive that the goal to be pursued has been imposed on them, they devalue the purpose and weaken their autonomous motivation, unlike when employees choose or participate in goal setting [17]. Despite this, leaders focus on monitoring whether or not employees are doing what their performance plans say they should be doing and can use rewards and sanctions to direct them to that aim [101].

Commonly, the behavior of control through objectives imposes deadlines, turning the work environment into a competition between co-employees, generating conflicts, mental health problems, and arguments, and affecting motivation [102,103]. "An externally imposed deadline for completing a task may result in diminished intrinsic interest in that task later on" [101]. Therefore, it makes sense that employees may not enjoy the task when their leaders demand deadlines instead of spending a significant amount of time on the job [31]. Furthermore, working to tight deadlines can "kill" the creativity of employees [104] and affect the self-efficacy of employees who may end up underestimating completion times and abandoning tasks [105]. Also, tight deadlines impair the ethical judgment of vendors [106]; besides, when employees feel the pressure of time to resolve labor issues, consistency in the choice of alternatives decreases, which could lead employees to risk situations for the organization [107].

The sixth controlling behavior is the intrusive authority of the leader, invading the employee's personal affairs that go beyond their responsibility in the context that unites them, such as sports, studies, or work [39]. As in sports, leaders expect employees to focus their entire lives on the imposed tasks [46]. The intrusive leader wants to impose "a specific and preconceived way of thinking and behaving" [46]. In different contexts, leaders use pressure language such as "you have to" [39], take their ambitions as a starting point, and assign tasks and responsibilities without considering the interests of subordinates [58]. In a work context, employees see their autonomy undermined when they feel compelled to behave by doing what their bosses want, controlling behavior over plans [98]. In high-stress competitive sports, the coach pressures athletes to win, damaging their motivation and commitment and taking them away from the goal of winning the competition [84]. At the same time, the imposition of complex demands with a large amount of mental

effort will cause less efficiency in accomplishing tasks [108].

The leader is also intrusive when it designs highly regulated activities, subservient to its self-esteem and reputation. For example, some employees may choose to perform a task, but the leader imposes the choice and how to develop it, affecting motivation toward lower levels of autonomy [55,109]. Research by Lechuga [110] found that teachers participating in mentoring programs perceive their mentors as intrusive when they offer unsolicited advice or excessive mentoring, which affects their autonomy. Similarly, intrusive parents lead their children to keep secrets, tantamount to hiding losses or inflating quarterly earnings reports in the workplace [111].

The last controlling behavior is when leaders use punishment with explicit or implicit threats with the goal of subordinate compliance [9]. Punishment, unlike reward, is a direct link between an act considered wrong and a disciplinary response. Additionally, punitive action is intended to decrease the likelihood of unwanted behavior rather than encourage the occurrence of the desired behavior [90]. The leaders know that punishment has an excellent control utility to achieve any behavior that the employees must show or in case the employee does not implement the proposals made by the leader [9,30,46]. To avoid punishment, employees may be forced to cheat and trigger behaviors based on the approval of others [90,112]. Research by Delrue et al. [113] found that athletes' autonomy was affected when their coaches threatened them with punishment for not doing what was indicated or reporting a fact later.

2.2. Review of instruments used to assess CMS in different contexts.

Different databases (Scopus, Web of Science, and Google Scholar) were used. The search began with keywords such as "motivational controlling style," "measure," "scale," or "questionnaire," according to SDT. A dozen of instruments evaluated CMS in five contexts: sport, education, family, dental health, and workplace. However, the questionnaires that assessed the motivational controlling style with leadership measures [114] and those that used self-made measures [31] were not considered for the analysis. Neither entered the evaluation of the work scale [48] because it is an adaptation of the Perceived Parental Autonomy Support Scale [47]. Therefore, it was considered to belong to the parents' scale. In the end, eight instruments remained in four contexts: sport, education, family, and dental health. In addition, all the instruments used in the analysis were used in multiple empirical investigations, which evidenced their reliability and content validity. The eight tools contain 82 items that correspond to the controlling behaviors reviewed. However, no items related to the use of punishment were found. Table 1 shows the information on the reviewed instruments.

3. Method

3.1. Participants and procedure

After obtaining the ethical approval for this study from the Research Ethics Committee of the Pontifical Catholic University of Peru (003/2021),[1] emails were sent to public organizations in Peru requesting their collaboration. It was decided to investigate public sector workers because the first author worked there for 26 years and was interested in gaining a deeper understanding of this sector. A message including the link to the questionnaire (Qualtrics) was sent to the organizations that agreed to participate so that employees could access it. Before answering the questionnaire, the participants had to give their informed (electronic) consent. The purpose of the study was described, and it was stated that their participation was voluntary and anonymous. Also, it was said that they could stop their participation at any time without any negative consequences. All participants speak Spanish as their mother tongue. A random sample was drawn from the large number of public agencies geographically located in different parts of the country but are representative of the labor groups they represent. Therefore, the research design is cross-sectional, and 1100 employees from the Peruvian public sector participated.

From the sample, 65.55 % were men, 32.18 % were women, and 2.27 % did not provide gender information. The average age was 41.32 years old (SD = 10.65). Regarding education, 67.10 % of the employees have higher education, and the remaining 32.9 % are those who finished high school but did not finish higher education or had technical careers. Regarding areas of work, 73.49 % work in the central government, 15.53 % in the regional government, and 10.98 % in the local government. The survey was conducted between July and October 2021.

3.2. Measures

All the items of the scales used were evaluated on a seven-point Likert scale (from 1, "Strongly disagree" to 7, "Strongly agree").

3.2.1. Proposal of questionnaire on controlling motivational style at work
Since the participants were Spanish-speaking and the questionnaire would be administered in Spanish, we used the Spanish versions when available. We translated the Subscale Supervisor Control Style [48] and the Perceived Control Style Scale in the Dental Clinic Questionnaire [53]. Two expert judges knowledgeable in English and proficient in the SDT literature performed the Spanish

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[1] This study is part of a larger study that aims to study a model on leadership styles (autonomy-support and control), types of motivation, work engagement, and organizational citizenship behavior. Participants answered 87 questions in total. Part of the questions (22 from the control style, 10 from the controlled motivation, and 6 from the autonomous motivation) were used for the present investigation.

Table 1
Instruments used to evaluate CMS in different contexts.

Number	Instrument name	Author(s)	# Dimensions. and items	Context	Adapted to the work context by	Spanish adaptation
1	Controlling Coach Behavior Scale	Bartholomew et al. [46]	5, 19	Sports	Sullivan et al. [54]	Castillo et al. [115], in Spain.
2	Control Style Scale in Physical Education	Moreno-Murcia et al. [50]	1, 9		It was not found	a
3	Teacher Control Questionnaire	Jang et al. [51]	1, 4	Education	It was not found	Herrera et al. [116], in Perú.
4	The Scale of Psychological Control of the Teacher	Soenens et al. [49]	1, 7		Thomas et al. [40]	Trigueros-Ramos et al. [117], in Spain.
5	Psychological Control Scale - Youth Self-Assessment	Barber [45]	1, 8	Family - Parents	Sarmah et al. [31] y Zhang et al. [44]	Gargurevich et al. [118], in Perú.
6	Parental Behavior Inventory Child Report	Schaefer [52]	1, 10		It was not found	Samper et al. [119], in Spain.
7	Subscale Supervisor Control Style[b]	Moreau and Mageau [48]	1, 12		Gillet et al. [42]; Kanat-Maymon et al. [39, 41]	c
8	Perceived Control Style Scale in the Dental Clinic Questionnaire	Halvari et al. [53]	1, 13	Dental Health	It was not found	c

[a] Original version in Spanish.
[b] It is an adaptation of the Scale of Support for Perceived Parental Autonomy [47].
[c] Available in English. Two expert judges did the translation into Spanish [120].

translation [120]. The translations were reviewed until they reached a consensus, emphasizing the linguistic and cultural aspects.

Next, each of the 82 items was reviewed according to their semantic content, trying to categorize them into groups that included the expected behaviors of the CMS and all the essential parts of the construct [121]. Then, groups of items were formed according to the type of controlling behavior, discarding the repetitions. Finally, 22 relevant items were selected that seemed to capture best the eight controlling behaviors that are part of the previously proposed taxonomy and, consequently, capture the meaning of control [122]. The content validity of these items was already analyzed in the previous validity studies and other empirical investigations using these instruments.

The wording of these 22 items was then edited to reflect the work environment better. For example, to measure controlling meaning by employing rewards, the original item "My trainer only rewards/praises me for making me train harder" from the Controlling Coach Behavior Scale [46] became "My supervisor only uses rewards or praise to make me work harder"; to measure intrusive behavior, the original item "I find my professional (dentist) decides too much" on The Perceived Control Style Scale in the Dental Clinic Questionnaire [53] became "My supervisor makes many decisions for me." We refer to the leader as a supervisor because that is the name of the person who monitors employees in performance management in public organizations [123].

Finally, we had a 22-item questionnaire with the 22 selected items (CMS-W-22). The participants were asked about their supervisor's CMS at work (see Table 2). Initial evaluation of the internal consistency of the CMS-W-22 resulted in a good internal consistency ($\alpha = 0.94$), indicating its reliability and coherence in the answers [124].

3.2.2. The multidimensional work motivation scale (MWMS) [61]

Eight items from the MWMS were used to assess the autonomous or controlled motivation of the organization's employees. Autonomous motivation (MWMS-AM, four items) includes questions such as: "Because what I do at work is exciting." Controlled motivation (MWMS-CM, four items) has questions such as: "Because otherwise, I will feel ashamed of myself." Validity of the MWMS was analyzed through confirmatory factor analysis (CFA). The weighted least squares mean and variance adjusted (WLMSV) method was used because it allows for the analysis of the polychoric correlation matrix for ordinal data.

MWMS obtained a good fit: robust RMSEA of 0.072 with upper and lower limits of a two-sided 90 % confidence interval (CI, 0.09 to 0.06); Robust CFI of 0.967; Robust TLI of 0.949 and SRMR of 0.029. The reliability of controlled motivation obtained an omega coefficient of 0.55 and an AVE of 0.34. Meanwhile, autonomous motivation got an omega coefficient of 0.84 and an AVE of 0.63. The degree of correlation between both variables was 0.671. A version of MWMS available in Spanish was used [125].

4. Missing data

Before statistical analysis, missing data from 1158 responses were analyzed. It can be considered that if a participant has less than 5 % missing data, it is not advisable to eliminate them from the analysis [126]. Of the 38 items analyzed (22 from the CMS-W and 16 from the MWMS), all responses with more than two blank responses were removed (5 % of 38). After this procedure, 1100 responses remained to apply a missing data procedure. Three types of evaluations are also recommended before establishing the missing data procedure: determining the percentage of missing data, studying the pattern of nonresponse, and performing Little's test [127].

Controlled motivation presented 0.24 % missing data, autonomous motivation 0.45 %, and CMS 0.52 %. The nonresponse pattern shows that most of the missing data are clustered at the bottom left of the pattern. These two tests are configured as a missing completely at random (MCAR) mechanism [127,128]. However, Little's test gave mixed results. Autonomous and controlled

Table 2
The 22 items were selected to assess CMS in a work context[a].

Item	Description	Controlling behavior
A2	My supervisor tries to motivate me by promising me rewards if I do well.	Use of rewards
A3	**My supervisor is less friendly to me if I don't see things his way.**	**Conditional negative regard**
A4	My supervisor raises his voice in front of others to get me to do certain things.	Intimidation
A6	My supervisor criticizes me harshly if I perform poorly.	Judging and devaluing
A10	My supervisor imposes his views when setting goals.	Control through objectives
A11	**I feel my supervisor decides on many things that do not correspond to him.**	**Intrusive authority**
A14	My supervisor only uses rewards or praise to make me work harder.	Use of rewards
A15	My supervisor is less supportive when I am not meeting my goals.	Conditional negative regard
A16	**My supervisor bullies me to get me to do what he wants me to do.**	**Intimidation**
A18	**My supervisor is very critical if I am not meeting the objectives.**	**Judging and devaluing**
A22	My supervisor sets deadlines for assignments without coordinating with me.	Control through objectives
A23	**My supervisor does not allow me to contribute at work meetings.**	**Intrusive authority**
A25	My supervisor tries to motivate me by offering me rewards/incentives if I exceed my goals.	Use of rewards
A26	**My supervisor is less accepting of me if I have let him down.**	**Conditional negative regard**
A27	**My supervisor embarrasses me in front of others if I don't do things he wants me to do.**	**Intimidation**
A28	My supervisor is very critical when he gives me feedback.	Judging and devaluing
A31	**My supervisor threatens me by telling me that keeping my job depends on achieving the objectives.**	**Control through objectives**
A32	**My supervisor makes many decisions for me.**	**Intrusive authority**
A34	My supervisor tells me that if I do my job the way he wants, he will give me rewards/incentives.	Use of rewards
A35	**My supervisor undervalues my contribution to the job.**	**Judging and devaluing**
A38	My supervisor encourages peers to compete against each other.	Control through objectives
A41	**My supervisor makes me feel like I should follow orders and not think.**	**Intrusive authority**

The items marked in bold correspond to the final version of the CMS-W.

[a] Note that the 22 items are not numbered sequentially from A1 to A22. This is because the 22 items are part of a larger study. Therefore, the numbering presented here corresponds to the larger research.

motivation obtained p > .05 (0.974 and 0.168, respectively), considered MCAR, while CMS received p < .05, which would not be MCAR.

Due to these results, it was decided to do some data imputation under the fully conditional specification (FCS) approach, also known as multivariate imputation by chained equations (MICE) using R [129]. MICE is effective in cases where a suitable multivariate distribution cannot be found [129]. What MICE does is a regression-type model for ordinal data (proportional odds model), and iteratively, the missing values are completed based on the probabilistic prediction made with the other variables. Imputation was done for each variable separately. Each missing data creates a probability of having the allowed value (1–7); from that distribution, it samples randomly. A seed was used in the code implemented with R to avoid a different base in case a diverse base is obtained in the

Table 3
Descriptive statistics, mean, confidence interval, variance, skewness, and kurtosis.

Item	Mean	Confidence interval		Variance	Skewness	Kurtosis
		95 %				(Zero centered)
A2	3.810	3.450	4.170	3.884	−0.009	−1.271
A3	3.350	3.030	3.600	3.108	0.250	−1.054
A4	2.645	2.340	2.950	2.889	0.910	−0.176
A6	3.190	2.870	3.510	3.134	0.378	−0.924
A10	3.925	3.600	4.250	3.289	−0.004	−1.072
A11	3.270	2.930	3.610	3.517	0.441	−0.967
A14	2.845	2.560	3.130	2.451	0.667	−0.393
A15	3.135	2.830	3.440	2.907	0.530	−0.688
A16	2.720	2.390	3.050	3.242	0.915	−0.280
A18	4.155	3.850	4.460	2.911	−0.359	−0.913
A22	3.760	3.430	4.090	3.362	0.030	−1.200
A23	2.820	2.510	3.130	2.878	0.809	−0.325
A25	3.475	3.150	3.800	3.219	0.247	−1.005
A26	2.930	2.630	3.230	2.715	0.645	−0.608
A27	2.500	2.210	2.790	2.600	0.989	0.059
A28	3.475	3.170	3.780	2.779	0.132	−0.867
A31	2.670	2.360	2.980	2.971	0.767	−0.563
A32	2.935	2.620	3.250	2.991	0.585	−0.825
A34	2.760	2.470	3.050	2.612	0.665	−0.472
A35	2.565	2.270	2.860	2.636	0.950	−0.032
A38	3.610	3.290	3.930	3.188	0.065	−1.046
A41	2.590	2.290	2.890	2.752	0.881	−0.234

Univariate distributions are asymmetric and have excess kurtosis. There are indices upper than one in absolute value. These results advised the use of polychoric correlation.

imputation process.

5. Statistical analysis

The Factor 8.02 program [130] was used for the exploratory factor analysis (EFA). For validation purposes, the sample of 1100 participants was divided into two parts under a simple random procedure to demonstrate the replicability of the results [131]. It is recommended that the threshold for the sample-variable ratio be 5:1 for exploratory factor analysis [132], and a minimum of 10:1 for confirmatory factor analysis [133]. A subsample of 200 cases was used for the EFA (9:1), and a subsample of 900 cases was used for the CFA (41:1).

Through the EFA, it was expected that the number of items analyzed would allow the number of items and dimensionality of the instrument to be brought closer [134]. Descriptive statistics (mean, confidence interval, variance, skewness, and kurtosis) based on the sample (n = 200) were calculated for each CMS-W item (see Table 3). The items under study are polytomous, measured on an ordinal scale, and have a non-normal distribution [135]. The Mardia criterion [136] was used to guarantee the multivariate non-normality of the data (Table 4).

It is recommended to use factorization methods based on polychoric relationships [137] when the correlation contains ordinal elements with asymmetric univariate distributions, excess kurtosis and presents indices with values greater than one in absolute value [138]. The robust minimum range factor analysis (MRFA) extraction method was used [139] with Promin oblique rotation [140] followed by a weighted Varimax rotation [141]. Additionally, to determine the number of factors, a parallel analysis (PA) was carried out with 500 random samples with a permutation of the raw data [142,143].

The applicability of the factor analysis was tested using Bartlett's test of sphericity and the Kaiser-Meyer-Olkin (KMO) value. When the Bartlett values obtain a significant value (p < .05), and the KMO is close to 1 but greater than 0.60, the relationship between the variables is significant for the functioning of the EFA [144]. The following were excluded from the analysis: factors with less than four items, items with values less than 0.40 in their communalities [145–147], items with factor loadings less than 0.30, and items with cross-loadings close to 0. ,1 [132].

The sample size and heterogeneity (n = 200) allowed for adequate EFA [145]. The first model consisted of a single latent factor that assumes all the items retained in the EFA; The second model, also with one factor, reached an acceptable level.

Using the results, the CFA was performed to validate the EFA findings and refine the scale structure if necessary [148]. The CFA was carried out with the LAVAAN package in R [149]. Due to the nature of the ordinal data, weighted least squares mean and variance adjusted (WLSMV) was implemented as recommended by Li [135].

Three robust fit indices and the SRMR (standardized mean residual) index were chosen to verify the goodness of fit in the CFA [150–152]. The robust RMSEA (root mean square error of approximation) with upper bound values of 0.07 is acceptable [151,153]. For robust CFI (comparative fit index) and robust TLI (Tucker-Lewis's index), scores greater than 0.95 are acceptable in both indices [152]. SRMR values less than 0.05 indicate the best fit [154].

The models obtained in the CFA were inspected to achieve a better fit. The inspection began with the factor loadings of the items that must reach values greater than 0.50 to remain in the model [155]. Modification indices with values greater than 3.84 demonstrate redundancy in the model. Two alternatives to resolve redundant elements are removing the elements with the lowest load factor or configuring the pair of elements by correlating their errors. All reviews were based on empirically data that has correlates with the theory [156,157]. Fit models were tested on each model obtained until an acceptable level was reached.

After establishing the model with the best fit to the data, the reliability of the CMS-W was evaluated with the omega coefficient, whose value must be equal to or greater than 0.70 to accept the scale as reliable. The average variance extracted (AVE) was calculated to validate the questionnaire, whose value must be greater than 0.50 [158].

At this point of the research, it was known that the CMS-W, MWMS–CM, and MWMS–AM presented satisfactory psychometric properties obtained in the respective CFAs. CFA models, including CMS-W and MWMS–CM (second-order models), test whether the two scales assess the same underlying latent construct (convergent validity) and whether CMS–W and MWMS–AM report on two correlated constructs but separately (discriminant validity).

We fitted a second-order model, where CMS-W (one factor) and MWMS (two factors, controlled motivation and autonomous motivation) loaded on a higher-order factor (i.e., we tested convergence by modeling the correlation between CMS-W and MWMS-CM as originating from the same source/latent factor). CMS-W was allowed to be correlated with MWMS–AM to test discriminant validity by modeling as independent constructs. A χ2 test was performed to test model differences [159]. Convergent/discriminant validity analyses were carried out using the Lavaan package in R.40. Nomological validity requires information recovered from at least one other reflective construct and that a theoretical relationship can be posited to exist between the constructs [160].

CMS-W measurement invariance was then tested across gender (male and female). Invariance could not be modeled about the

Table 4
Analysis of the Mardia's multivariate asymmetry skewness and kurtosis.

	Coefficient	Statistic	df	P
Skewness	142.782	4759.389	2024	1.0000
Skewness corrected for small sample	142.782	4837.058	2024	1.0000
Kurtosis	673.388	31.636		0.0000

** Significant at 0.05.

category of government where the participants work (national, regional, and local) because, in small groups, there were response categories to items that did not appear (frequency 0). The invariance test provides information on whether differences in scores are due solely to changes in the latent construct and not to exogenous sources of variation.

Ordinal data lack characteristics that allow them to describe means, variances, and covariances with other variables; therefore, alternative methods must be used [161]. The invariance test was tested using Wu and Estabrook's approach [161], which consists of applying a sequence of constraints and comparing global model fit indices between each constrained model. The current practice of invariance testing is first to identify a model with only configural invariance and then test for parameter invariance based on this identified reference model.

The first step was to establish configural equivalence by constraining the factor structure of the model to be the same across all groups. The configural model defines the scale of each latent continuous response and provides each with a mean and variance for subsequent analysis. The second step was establishing threshold equivalence by further constraining item thresholds to be the same across groups. The third step is to select a model with threshold and loading invariance by further constraining the factor loadings of the items to be the same across all groups (i.e., a one-unit increase in the scale has the same meaning across all groups compared). The third step is more restrictive than the reference model and can be tested.

Achieving scalar equivalence means that questionnaire scores are comparable between groups. Therefore, we tested whether the CMS-W model across genders is structurally similar (configural equivalence), whether the items report symptoms at an equivalent level (threshold equivalence), and whether they are equally correlated with the latent factors and whether the latent means are equivalent (threshold and load equivalence).

Values of ΔCFI <0.01 and ΔRMSEA <0.015 or ΔSRMR <0.010 between nested models with increasing levels of constraints indicate equivalence [162–164].

6. Results

The KMO measure was 0.93, exceeding the recommended value of 0.60, indicating that the sample size was good. Bartlett's test reached statistical significance $= X2 = 2197$, df $= 231$, p $= .000010$, meaning the correlations between items were sufficiently significant. Therefore, the interpretation of the results continued.

Parallel analysis (PA) suggested two factors. The first factor explains most of the variance with 62.77 %, and the second is 11.12 %. The cumulative variance is 73.89 %, higher than the standard cut-off value of 50 % [165]. The most significant amount of the variance of the first factor explains CMS-W [166]. Table 5 shows the factor loadings after rotation and PA. The communalities of all items were above 0.40. Item A25 was eliminated because it presented a Heywood case with a factor loading of 1.06, greater than 1 [167]. Items A2, A14, and A14 were also eliminated due to cross-factor loading.

The second factor, comprised of items A28, A34, and A38, presented a correlation of 0.75 with the first factor. The second factor was eliminated from the analysis because it had a high correlation and did not reach the minimum value of four items. Based on the remaining 15 items, a unidimensional model involving a single latent trait of the CMS-W was obtained [168].

The second EFA was carried out with 15 items, obtaining a KMO of 0.949 and a statistical significance of p < .001 with the Bartlett test. The unidimensional factor explains 76.94 % of the variance. The model features a 0.954 Ω. Therefore, the structure of the model

Table 5
Parallel analysis (PA) based on minimum rank factor analysis and Rotated Loading Matrix.

Item	Real-data % of variance	Mean of random % of variance	95 percentile of random % of variance	Item	F1	F2
1	**55.6905**[a]	**9.6013**	**10.535**	A2	−0.603	0.994
2	**9.5795**[a]	**8.7845**	**9.5595**	A3	0.647	0.09
3	5.909	8.1573	8.8287	A4	0.493	0.308
4	4.6629	7.6258	8.1532	A6	0.605	0.201
5	3.9204	7.1469	7.6395	A10	0.893	0.227
6	2.8427	6.6995	7.1300	A11	0.837	0.146
7	2.4560	6.2747	6.6920	A14	0.493	0.311
8	2.2232	5.8598	6.1954	A15	0.798	0.034
9	1.9460	5.4492	5.7943	A16	0.853	0.045
10	1.6481	5.0502	5.3768	A18	0.407	0.183
11	1.5041	4.6532	4.9722	A22	0.927	0.294
12	1.3582	4.2654	4.5982	A23	0.666	0.156
13	1.2330	3.8566	4.2141	A25	−0.394	1.061
14	1.1588	3.4848	3.9028	A26	0.737	0.115
15	1.0353	3.1052	3.4862	A27	0.784	0.099
16	0.8275	2.7213	3.1552	A28	0.193	0.513
17	0.7509	2.3073	2.7507	A31	0.784	0.102
18	0.5800	1.8955	2.3758	A32	0.708	0.09
19	0.3534	1.4708	2.0018	A34	0.11	0.748
20	0.2456	1.0172	1.5199	A35	0.836	0.005
21	0.0750	0.5734	1.0024	A38	−0.296	0.892
				A41	0.781	0.091

[a] Advised number of dimensions: 2.

was not modified.

The fifteen items were distributed into six types of controlling behaviors: conditional negative regard (items A3, A15, and A26); judging and devaluing (items A6, A18, and A35); control through objectives (items A10, A22, and A31); intimidation (items A16 and A27); and intrusive authority (items A11, A23, A32 and A41).

The initial CFA model with fifteen items (CMS-W-15) obtained a poor fit: Robust RMSEA = 0.104 with 90 % confidence interval [90 %CI] = 0.099 to 0.109; Robust CFI = 0.916; Robust TLI = 0.902 except SRMR = .049. The reliability of this first model reached omega (Ω) = 0.954 and AVE = 0.584. Next, the modification indices (MI) were evaluated, reporting the covariance of the errors. The correlations with the highest error values were considered: item A10 and item A22, with an MI of 230.3; A10 and item A31, with an MI of 23.00; A10 and item A27, with an MI of 18.70 and A10 and item A35, with an MI of 15.60. Other covariances also presented high values (A3 ~~ A6 = 60.5 and A15 ~~ A26 = 42.4). Attention was focused on the correlations with the highest value, and item A10 was present in four correlations. The value of the factor loadings of items A10 and A22 was evaluated as 0.623 and 0.651, respectively. Both loads exceed the recommended value of 0.50. Finally, the theoretical relevance of the correlated items was reviewed. Items A10 and A22 refer to control through objectives. Both manifest the imposition of objectives that devalue the purpose and weaken the autonomous motivation of workers. Given the statistical and theoretical evidence, an additional model, the CMS-W-14, was evaluated by eliminating item A10.

The model with 14 items also did not achieve an optimal fit: Robust RMSEA = 0.094 with 90 % CI = 0.089 to 0.09; Robust CFI = 0.937; Robust TLI = 0.926 except for SRMR = 0.04. The reliability of the second model reached Ω = 0.949 and AVE = 0.596. The factor loadings were examined; all values were more significant than 0.50 (range. 504 to 0.884). Next, the MIs were evaluated, reporting the covariance of the errors. The highest error covariances, with higher MIs, are repeated for the items: A6 (A3 ~~ A6 = 61.7; A6 ~~ A18 = 15.1); A15 (A15 ~~ A26 = 39.7; A15 ~~ A27 = 11.1; A15 ~~ A41 = 13.8) and A22 (A18 ~~ A22 = 36.6; A22 ~~ A27 = 11.9). Items A6, A15 and A22 were eliminated.

The CMS-W-11 was subsequently evaluated. The analysis confirmed the good unidimensional structure of the CMS-W with 11 items (Robust RMSEA = 0.071 with 90 % CI from 0.064 to 0.078; Robust CFI = 0.975; Robust TLI = 0.969; SRMR = 0.025). CMS-W-11 obtained an omega of 0.93 and AVE of 0.63, showing excellent reliability. Table 6 contains the results of the CFA's and Table 7 shows statistical values of the eleven items CMS-W.

Subsequently, convergent and discriminant validity was obtained by correlating the CMS-W-11 and the types of controlled and autonomous motivation measured through the MWMS. The results are shown in Table 8. The CMS-W-11 had a weak but statistically positive and significant correlation (r = 0.26, p < .001) with controlled motivation. Furthermore, it was observed that the CMS-W-11 had a weak but statistically negative correlation (r = −0.27, p < .001) with autonomous motivation. Various authors obtained similar results [169–172], showing the convergent and discriminant validity of the CMS-W-11 with the types of controlled and autonomous motivation. Therefore, our results support the nomological validity of our CMS-W measure.

Next, the invariance for the factor structure of the CMS-W-11 according to gender (female and male) was analyzed using a multigroup analysis. Invariance will provide information about how different groups view the CMS-W. For example, men and women are believed to have different perspectives in the workplace [173]. First, a model with only configural invariance was identified as a reference model, then threshold invariance, and finally, a model with threshold and loading invariance.

Invariance analysis resulted in ΔCFI <0.01 and ΔRMSEA <0.015 or ΔSRMR <0.010 between nested models with increasing levels of constraints (Table 9). The results suggest that CMS-W-11 is equivalent by gender and can be compared among this group.

7. Discussion

This study aimed to elaborate and analyze the validity and reliability of a questionnaire on Controlling Motivational Style al Work (CMS-W) based on a literature review of the types of controlling behavior and questionnaires validated by expert researchers of the SDT that evaluated the CMS in different contexts. Although researchers have been studying the CMS in the work context with questionnaires adapted from other contexts or validated for another motivational management style, we seek to develop a specifically designed to assess controlling behavior in the work context [54]. We believe that a correct theoretical measure, without ambiguities, will allow significant testing of the theory [46,174] and examine the "unique and differential" associations of the construct.

The CMS-W-11 includes five types of controlling behavior that converge into one factor: conditional negative regard, judging and devaluing, control through objectives, intimidation, and intrusive authority. All these behaviors are aligned with the theoretical concepts, scientific research, and practical aspects of the SDT. CMS-W-11 obtained acceptable fit indices.

The behaviors of conditional negative regard, intimidation, and intrusive authority appear in all the questionnaires that served as a

Table 6
The goodness of fit indices of confirmatory factor analysis.

Models	Robust RMSEA	confidence interval 90 %		Robust CFI	Robust TLI	SRMR	Ω	AVE
		lower	upper					
CMS-W-15	0.104	0.099	0.109	0.916	0.902	0.049	0.954	0.584
CMS-W-14	0.094	0.089	0.099	0.937	0.926	0.040	0.949	0.596
CMS-W-11	0.071	0.064	0.078	0.975	0.969	0.025	0.930	0.630

CMS-W-15-item: Questionnaire of the Managerial Controlling Motivational Style; Modified CMS-W-14: item A10 was removed from CMS-W15; Modified CMS-W-11: items A6, A15 and A22 were removed from CMS-W-14.

Table 7
Statistical values of the eleven items CMS-W.

Item	Factor loading	SE	z-value	P (>|z|)
A3	0.649	0.019	34.309	0.000
A11	0.774	0.014	57.004	0.000
A16	0.873	0.009	96.183	0.000
A18	0.470	0.023	20.061	0.000
A23	0.780	0.013	59.118	0.000
A26	0.758	0.014	54.845	0.000
A27	0.891	0.008	113.842	0.000
A31	0.862	0.009	93.600	0.000
A32	0.814	0.012	70.511	0.000
A35	0.885	0.009	103.888	0.000
A41	0.859	0.010	88.034	0.000

SE = Standard error.

Table 8
Correlation between CMS-W-11 and controlled and autonomous motivation.

	CMS-W-11	Controlled motivation
Controlled motivation	.257 ***	1
Autonomous motivation	−.272 ***	.670 ***

***p < .001.

basis. Meanwhile, the behaviors of control through objectives and judging and devaluing coincide only with the educational context, specifically with the scales of Jang [51] and Moreno-Murcia et al. [50]. These only coincidences might be because work and educational contexts share the same characteristic that both leaders/teachers try to encourage their employees/students to meet assigned objectives [50,101] and sometimes using controlling behaviors. However, the importance of achieving objectives for "survival" in work organizations makes leaders very critical or inflexible when employee performance is not as expected [5,46]. Questionnaires from other contexts do not consider judging and devaluing behaviors or control trough objectives, which could be the subject of future research.

CMS-W-11 represents a comprehensive measure that evaluates all control behaviors that, to our knowledge, appear in the literature, demonstrating its originality and usefulness. However, rewards and punishments, two controlling behaviors that characterize the CMS, are absent in CMS-W-11. Despite believing that punishment has its own identity, rewards and punishments can be considered part of a single controlling behavior [90], which can also be studied in the future.

The absence of rewards could be because public employees would be more motivated by public service and prefer professional development, fair treatment, or recognition of service over rewards [69]. Although public organizations offer reward schemes, such as pay for performance or promotion opportunities, it could be that public workers show other motivations, such as a more genuine or authentic public motivation, before interest in rewards [69]. Furthermore, the government is limited in offering financial rewards, which might not be the case in the private sector [69]. Finally, studies report that public workers are less motivated by monetary rewards than private workers [175], which might need more study.

CMS-W-11 contains an item that belongs to control through objectives. It calls our attention that only one revised scale [50] has considered control through objectives, although the imposition of deadlines and goals is regarded as a common motivational strategy [3,11,17,20,22,50]. When leaders set specific and complex employee goals, they can generate efficient behaviors and maximize performance, which could have an effect autonomous motivation [176]. The two items corresponding to judging and devaluing fit those leaders with a greater controlling style with a high possibility of provoking undisciplined behavior in workers. This is why it is important to be avoided due to the potential damage to the organization's objectives [172].

Two items from CMS-W-11 pertain to conditional negative regard, representing leaders who value their employees unequally based on outcomes [177]. Two other items refer to intimidation behaviors that obtained the highest factor loadings (0.891 and 0.873), possibly because the participants belong to the context of public employment with high levels of formalization and demand. For example, in work pressures in performance management, leaders play an essential role in motivating employees [177,178].

Intrusive authority is the controlling behavior with four items and the most significant presence in the CMS-W-11. In public work organizations, leaders may be unwilling to take risks in their decisions and show little trust in their employees [179,180]. Consequently, leaders tend to limit their employees' participation to following orders rather than thinking for themselves, undermining autonomous motivation and effective task performance, such as in public settings [40,181].

CMS-W-11 appeared from a comprehensive approach by combining the efforts of eight instruments developed by SDT academics. This contradicts what researchers usually do by taking only one instrument to validate or reduce it [64]. Therefore, comparing the characteristics of the eight revised questionnaires was beneficial to obtain more information for elaborating and validating the proposed scale. This creates a very comprehensive tool that leverages a lot of previous research.

To the best of our knowledge, the literature review showed a clear gap due to the lack of a questionnaire that evaluates the motivational controlling style validated in the workplace. The CMS-W-11 is proposed to fill this gap so that researchers can provide

Table 9
CMS-W-11 invariance gender testing.

Constraint	Df	Chi	p	RMSEA	CFI	SRMR	Model comparison	ΔDf	ΔChi	Δp	ΔRMSEA	ΔCFI	ΔSRMR
Configural	88	134.82		0.091	0.987	0.030							
Thresholds	132	146.02	0.839	0.060	0.991	0.030	Configural	44	11.2	0.839	0.031	0.004	0.000
Thresholds & Loadings	142	178.87	0.007	0.056	0.992	0.031	Tresholds	10	32.85	0.832	0.004	0.001	0.001

Δ = differences between fit indices.
Decision is based on ΔCFI <0.01 and ΔRMSEA <0.015 or ΔSRMR <0.010, which indicate model equivalence.

precision and efficiency in their studies validated in empirical data.

The large sample size (1100 participants) and psychometric solid results of the CMS-W-11 give evidence that an instrument that consistently assesses the CMS of leaders in work organizations is available. The evaluation of invariance underlines the validity of CMS-W-11. The unidimensionality of the questionnaire reflects its ability to explain a single latent trait, an essential requirement to generate adequate measures [182].

8. Practical implications

This research has some practical implications for the workplace. First, this study shows the importance of the social context in forming employee motivation that will favor the creation of organizational value [183]. If the leader's controlling style prevents corporate meanings from being shared and becomes demanding of the employee, it will likely make it challenging to achieve the goal. Second, there is the degree of stability or turbulence that organizations face. In crisis circumstances, more structure is needed. Thus, leaders might need to give information, explain the procedures clearly, and provide orientation and guidance to the workers. Moreover, organizational instability can create a need for clear guidelines, goal rewards, or deadlines [18,184].

Third, leadership with a controlling style has the same implications for the public and private sectors. As the respondents are from the public sector, employees might mistakenly think that a controlling style (apparently) leads to better performance levels [66]. However, it is known that using rules and procedures is essential for excellent overall performance in any labor field, but it will work better if it is given in an autonomy-supportive way [185].

Some public sector leaders adopt and enact a controlling style during their work hours. Various factors may push them toward a controlling style, including citizen demands for better public services, accountability, personal dispositions, not knowing other forms to motivate workers, or just following what has been done before. The MWS-W-11 could help organizations describe the profiles of leaders and, from there, carry out improvement and training programs that allow leaders to know how to provide explanatory foundations instead of intimidating, how to use informative language and not judging and devaluing, how to act with tolerance in explanations to recognize and accept expressions of negative affect from workers. This means training on an autonomy-supportive leadership style [5].

Several studies report that CMS can have consequences on workers' health, such as stress or psychological illnesses. Additionally, CMS can cause high employee turnover, resignations, and a lack of interest in new workers applying to the organization. Consequently, companies would have to allocate more budget to solve these problems. CMS-W-11 could help identify leaders who may be causing harm economically to companies with their leadership style [25,88,176].

Finally, part of the managerial effort is to adapt to the characteristics of each organization. For example, in the case of requiring a leader responsible for focusing and controlling the employees' struggles, leaders might think that the controlling style would be aligned with the organizational characteristics. In this case, the leader probably would put aside his own characteristics to adapt to the aspirations of the organization [5,30], but this is likely to come with high costs in terms of employees' motivation and performance. Consequently, studying the motivational controlling style of a leader is of great importance as it is a crucial actor in the motivation of employees and the organizational results.

9. Limitations, future direction, and conclusions

Several limitations were identified. First, data were collected through self-reports from the employees' perspective; therefore, the responses reflect their perceptions. This limitation could be addressed by including leaders and their self-reports to study them with employee reports [30,184]. The research sample was obtained under social restrictions due to COVID-19. In this context, workers worked remotely. To reach workers/participants, the heads of human resources departments of public organizations were used. As all communications were conducted via WEB, coverage may not have been guaranteed to all target population members due to possible lack of access to computers, the Internet, or adequate computer skills to complete the survey. It is also possible that a good representation of the sample population has not been achieved since the heads of the human resources departments were the ones who decided which sectors of their organization would participate in the development of the WEB questionnaire [186].

Second, despite the contribution of the CMS study in the workplace, the results are based on cross-sectional designs. In addition, it is essential to continue working on the construct and on its operationalization in longitudinal studies. Cross-sectional research is not as conclusive as longitudinal research. However, this cross-sectional research allowed us to develop an academic proposal economically and efficiently. The increase in the study of CMS justified the development of a scale validated in the work context. This proposal could be considered initial while other longitudinal investigations are developed. Furthermore, the post-COVID-19 period influenced the choice of the cross-sectional design because it was timely to know how workers perceived the CMS of their leaders when citizens were demanding the achievement of public objectives, such as health or transportation.

To continue verifying the usefulness of the proposed instrument, it would be necessary to understand more precisely how the CMS, as evaluated by the CMS-W, is involved in the reduction or optimization of the motivation or the satisfaction or frustration of basic psychological needs of employees over time, among other performance outcomes. For example, studies might examine performance management, leadership styles in environments of uncertainty or certainty, or the interaction of leaders with middle leaders. Likewise, programs that promote autonomy support and reduce the controlling style could be carried out [5,187].

Third, although the participation of a significant sample of Peruvian public sector employees was obtained to perform the statistical analysis, future research could include private or mixed sector employees in this or different countries [175]. It is expected that by using CMS-W-11 on other samples, the results might be similar because the fundamentals of SDT are universal [17].

Fourth, analyzing factor structures is one of psychological studies' most critical psychometric evaluations. It analyzes variables (items) obtained frequently from Likert scales [150]. Generally, the items are ordinal measurements that present asymmetry. The researchers must choose the appropriate parameter estimation method and resort to polychoric correlations. Treating the items obtained on Likert scales as continuous variables would have produced biased estimates, and the poorly specified model would have been applied.

The beneficial effects of autonomous, relative to controlled motivation, have been consistently studied in nations worldwide with cultural backgrounds ranging from highly individualistic to highly collectivistic [17,18,21,23,188]. The CMS-W is based on questionnaires with validity evidence, but much of the published research comes from WEIRD countries (Western, Educated, Industrialized, Rich, and Democratic). Therefore, conducting research in countries like Peru is essential, but it would be necessary to do future research using the CMS-W in other cultural settings.

Given that this study developed and analyzed the validity and reliability of the CMS in a work context for the first time, we believe that this is a noteworthy result that has important implications for work organizations and researchers.

CMS-W-11 does not have rewards-related items in its structure, even though reward is an instrumental mechanism frequently used to achieve goals. To continue increasing knowledge, other researchers could conduct future studies using the initial 22 items selected for the present analysis in private or mixed workers samples.

An advantage of the CMS-W-11 over the other questionnaires reviewed is that it is the only instrument that assesses the leader's most controlling characteristic: judging and devaluing [172]. A more controlling behavior style (judging and devaluing) affects autonomy and predicts undisciplined behaviors. Therefore, CMS-W-11 can help organizations explain or prevent indiscipline behaviors among workers should leaders opt for more controlling leadership styles.

The work context differs from the sports, educational, or parental context. The work context is competitive, requires strategies for greater profitability, and acts on clients or markets. In public labor, strategies are also needed to satisfy high citizen demands. In all work environments, top management requires compliance with organizational plans and policies that can affect the motivation and performance of leaders and workers. Leaders would choose to control their workers through objectives to meet higher demands, negatively affecting workers' motivation. Despite evidence of the usefulness of a leadership style that supports autonomy in work organizations, leaders would continue to opt for traditional control models. That is why it is essential that in the structure of the CMS-W-11, there is an item that evaluates controlling behavior through objectives that the other scales do not have.

In summary, the questionnaire on Controlling Motivational Style at Work (CMS-W) results from a systematic review of different previously validated questionnaires in the work. Secondly, labor organizations will have an instrument to evaluate leaders' CMS and study how it relates to the motivation of human capital and organizational goals. Finally, SDT is consolidated as a theoretical framework and is helpful for labor organizations as a management instrument.

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Ethics statement

This study was reviewed and approved by the Research Ethics Committee of the Pontifical Catholic University of Peru, with approval number 003/2021.

All participants provided informed consent to participate in the study.

All participants provided informed consent for the publication of their anonymized case details and images.

Additional information

No additional information is available for this paper.

Data availability statement

The data will be available at the following link: http://bit.ly/Heliyon-D-23-35351.

CRediT authorship contribution statement

Luis Lobaton Gonzales: Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Project administration, Methodology, Investigation, Formal analysis, Conceptualization. **Lennia Matos:** Validation, Supervision, Methodology, Conceptualization. **Anja Van den Broeck:** Supervision, Conceptualization. **Andrés Burga:** Software, Formal analysis, Data curation.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.heliyon.2024.e25478.

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