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Original Article

Influence of leadership style on the management control system in the undersecretariat of the Ministry of Health

Influência do estilo de liderança no sistema de controle gerencial em subsecretaria do Ministério da Saúde

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RESUMO

O estudo analisa, a partir da percepção de servidores liderados da Subsecretaria de Assuntos Administrativos do Ministério da Saúde, a influência dos estilos de liderança transacional e transformacional sobre o uso dos sistemas de controle gerencial (SCG). Para isso, foi realizado um levantamento com servidores de unidades administrativas do Ministério da Saúde, utilizando instrumentos de pesquisa adaptados de Souza e Junior (2018) e de Damke et al. (2011). Esses instrumentos, por sua vez, derivam dos modelos teóricos de Bass e Avolio (1995) e de Simons (1995), permitindo captar as percepções dos respondentes tanto sobre o estilo de liderança de seus gestores quanto sobre o uso do SCG. A amostra compõe-se de 72 liderados, cujas respostas ao questionário deram-se pelo *Google Forms*. Na análise de dados, utilizou-se estatística descritiva e, para os testes de hipóteses, aplicou-se a técnica de Modelagem de Equações Estruturais. Os resultados mostraram que a liderança transformacional não configura como antecedente do uso do SCG e que, no setor público, consideradas as unidades administrativas pesquisadas, o estilo de liderança transacional tem importante papel em explicar as escolhas dos sistemas diagnóstico e interativo, mas não o sistema de crenças, nem o de limites. Estudo traz ainda *insights* sobre a preponderância da existência de liderados inclinados para as premissas do *homus economicus.*

Palavras-chave: Sistemas de controle gerencial; Estilos de liderança; Setor Público

ABSTRACT

The study analyzes, based on the perception of civil servants led by the Undersecretariat for Administrative Affairs of the Ministry of Health, the influence of transactional and transformational leadership styles on the use of management control systems (MCS). To this end, a survey was conducted with civil servants from administrative units of the Ministry of Health, using research instruments adapted from Souza and Junior (2018) and Damke *et al*. (2011). These instruments, in turn, are derived from the theoretical models of Bass and Avolio (1995) and Simons (1995), allowing for the collection of respondents' perceptions of both their

managers' leadership style and the use of MCS. The sample consists of 72 subordinates, whose responses to the questionnaire were provided via Google Forms. Descriptive statistics were used in the data analysis, and Structural Equation Modeling was applied for hypothesis testing. The results showed that transformational leadership is not a precursor to the use of MCS and that, in the public sector, considering the administrative units surveyed, transactional leadership style plays an important role in explaining the choices of diagnostic and interactive systems, but not the belief system or the limits system. The study also provides insights into the preponderance of followers inclined toward the premises of *homo economicus*.

Keywords: Management control systems; Leadership styles; Public sector

1 INTRODUCTION

The understanding of the dynamics between leadership and management control systems remains a core theme in organizational research, especially in light of the challenges of innovation, digitization, and strategic ambiguity. Both classic and recent studies show that leadership styles — such as transformational and transactional — substantially influence the structuring and use of management control systems (Simons, 1995; Cruz & Frezatti, 2015). For instance, transformational leadership is associated with enabling control systems — such as belief systems and interactive controls — that favor autonomy and innovation. Transactional leadership, on the other hand, tends to be linked to more rigid, goal-oriented mechanisms, such as diagnostic control systems (Chen et al., 2022; Fitri et al., 2024).

Furthermore, empirical evidence suggests that the choice and use of these control levers vary according to leadership style, as shown in recent research in the public sector (Mendes & Theiss, 2025) and broader organizations (Cruz & Frezatti, 2015).

Therefore, this premise is similar to the functions attributed to transactional and transformational leadership. In fact, while transactional leadership emphasizes focus on metrics, performance, and fulfillment of agreed-upon tasks, transformational leadership seeks to foster creativity and innovation, stimulating the creation of new ideas and openness to change (Bass & Avolio, 1994). This conceptual distinction, therefore, dialogues directly with the logic of management control systems, insofar as each leadership style tends to align with different mechanisms of organizational coordination.

In this context, the present study uses Simons' (1995) control levers, which focus on the importance of balancing the need for control and goal achievement through diagnostic and limit control systems, and the need for learning and innovation to enable constant adjustment to changes in the environment through interactive belief and control systems (Kominis & Dudau, 2012). Within this scope, transactional leadership is conceptually intertwined with diagnostic and limit systems, while transformational leadership is closely related to belief and interactive systems, reinforcing the argument that leadership styles influence, and are influenced by, managerial control choices within organizations.

In light of these conceptual relationships between leadership styles and control levers, it is important to understand how different uses of the Management Control System (MCS) materialize in organizational practice.

According to Simons (1995), the diagnostic use of the Management Control System (MCS) represents the traditional role of feedback, as the MCS is used to monitor and reward the achievement of pre-established goals, while the interactive use of the MCS is useful for expanding opportunities and learning by stimulating the development of new ideas and initiatives and guiding the emergence of strategies from the bottom up (Henri, 2006). In this sense, the way control systems are applied depends significantly on the role of the leader, who influences the synergy between control and creativity throughout the organization. Leaders encourage employees to explore new experiences, as long as they are aligned with organizational expectations, promoting a balance between autonomy and compliance (Adi & Sukmawati, 2020).

Complementing this perspective, Bass (1990) argues that traditional leadership theories have focused on the assignment and completion of tasks by employees in exchange for possible rewards or sanctions by the leader. This leadership style, known as transactional, is restricted to basic transactions between leaders and employees (Samanta & Lamprakis, 2018). Thus, the transactional leader is committed to existing procedures, insists on current practices, and tends to neglect the development of

new ideas, limiting the potential for innovation, although ensuring the efficiency and operational effectiveness of the organization.

In view of this aspect, Bass (1990) identified the need to develop a new leadership model capable of encouraging and motivating employees beyond their personal interests — that is, motivating them to pursue the greater good for the team and the organization. This leadership style was defined as transformational leadership (Samanta & Lamprakis, 2018).

Regarding the taxonomy of leadership styles in this study (transactional, transformational), the study by Samanta and Lamprakis (2018) promotes the practice and development of transformational leadership qualities in Greek public institutions. On this theme, they suggest future research focusing on larger public organizations, using random sampling, and further exploration of the concept of leadership and its effect on organizational outcomes.

In light of this, the research question aims to answer what influence leadership style has on the use of management control systems, from the perspective of subordinates, in administrative units of the Undersecretariat of the Ministry of Health. Thus, the main objective of this study is to analyze, based on the perception of subordinates in the Undersecretariat for Administrative Affairs of the Ministry of Health, the influence of leadership style (transactional, transformational) on the use of management control systems.

This study contributes to the literature on MCS by providing evidence of leadership style and the use of MCS from the perspective of subordinates in Brazilian public institutions, since previous studies in this field have focused on analyses from the leader's perspective.

2 LITERATURE REVIEW

2.1 Leadership Style

Individuals adopt varying approaches to communication, control choices, action implementation, and empowerment. These differences can be explained by

managers' personalities and behavioral traits, which are conveniently summarized as "leadership style" (Abernethy et al., 2010).

To conduct this study, the transformational and transactional leadership styles were adopted, whose choice is justified by their relationship with the themes of innovation, empowerment, exchanges, and monitoring, as well as by the prominence that transformational leadership has received in the literature (Judge & Bono, 2000) and transactional leadership, in combination with the former, represent optimal leadership behavior (Bass & Avolio, 1990).

According to Tummers and Knies (2013), researchers need to focus on studies concerning leadership dimensions specific to the public sector in different countries, with different cultures and values (Mavhungu & Bussin, 2017), since leadership, as a tool for motivating employees and mobilizing resources to fulfill the organization's mission, can function as a precursor to MCS — that is, as an element capable of influencing it (Cruz, 2014), essential for innovation, adaptation, and organizational performance, and has the power to influence staff (Antonakis & House, 2014).

In this line, Bass and Avolio (1990), using a comprehensive research questionnaire entitled Multifactor Leadership Questionnaire (MLQ), measured and evaluated transactional, transformational, and laissez-faire leadership styles. Based on this evidence, transactional leadership, which focuses on meeting the requirements of the exchange, is only a basis for effective leadership, since transformational leadership builds upon transactional leadership, amplifying the leader's effects on the effort and performance of followers (Bass & Avolio, 1990).

Along this same line of thought, in MLQ, transformational leaders elevate employees' desires for fulfillment and self-development, while promoting the development of groups and organizations (Bass & Avolio, 1990). Corroborating this perspective, in a study on subordinates' perceptions of transformational and transactional leadership, Hater and Bass (1988) argue that a leader tends to thrive when, faced with a more skilled workforce eager to apply and develop their skills,

they encourage learning experiences and new ways of thinking — characteristics of transformational leadership. On the other hand, leaders who limit themselves to rewarding performance as previously agreed tend to fail to energize a workforce seeking personal fulfillment.

Regarding subordinates' perceptions of the use of MCS, Lopez-Valeiras et al. (2018), through a study conducted in the three largest hospitals in the state of Santa Catarina (Brazil), concluded that the effect of MCS on employees differs according to hospital ownership, professional group, and type of contract. These findings show that the effects of management control systems vary according to the organizational context and the characteristics of individuals, which highlights the importance of considering behavioral and managerial factors when analyzing control choices. In this sense, understanding the effect of leadership style on control choices benefits those responsible for management selection and development and highlights a factor often overlooked in control choice theories (Abernethy et al., 2010).

2.2 Use of Management Control Systems

An organization's management control system (MCS) is designed to support its strategy (Widener, 2004). In this sense, "control processes and their mechanisms are combined and used together as an MCS" (Jukka & Pellinen, 2020, p. 427).

Based on this strategic conception of control systems, leadership plays a central role. Encouragement from supervisors fosters creativity, which is one of the responsibilities of leaders in organizations, exercised through appropriate systems or procedures that emphasize values and make it clear that creative efforts are a top priority (Amabile, 1998). However, depending on how they are designed, formal systems and structures can become barriers to creativity, failing to adequately address the uncertainty associated with innovation and creativity.

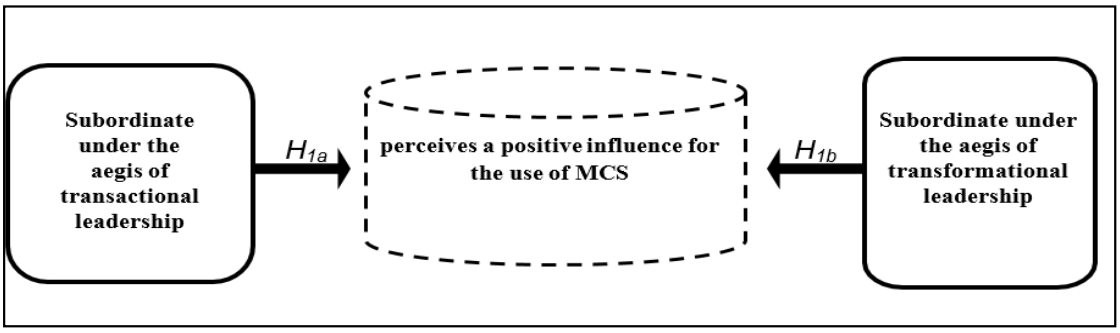
In this context, different types of control systems fulfill specific functions. The belief system, for example, defines the purpose and values of the organization and is

useful for inspiring and directing the search for opportunities; the boundary system comprises measures that delimit acceptable behaviors; the diagnostic system represents mechanisms aimed at motivation, monitoring, and rewarding the results achieved; and the interactive system seeks to stimulate organizational learning and enhance emerging strategies (Simons, 1995; Damke & Santos, 2021; Pletsch et al., 2016).

Furthermore, MCS can be managed in several ways, and its management is inherently subjective, since the interpretation of results and the response to procedures, when the system is applied in a given context, vary according to the decisions made by each leader (Cugueró-Escofet & Rosanas, 2013).

Given this subjectivity in MCS management, its use can result in varying effects on the organization and its activities, which, in turn, can be influenced by manager characteristics, such as leadership style. Thus, after discussing the implications that the adoption of different leadership styles can have on the management and use of MCS, and considering that transactional leadership tends to be associated with diagnostic and boundary systems, while transformational leadership is linked to belief and interactive systems, the following research hypotheses were formulated, represented in the theoretical model presented in Figure 1.

Figure 1 – Theoretical Research Model



Note: H_{1a}: The subordinate, under the command of a transactional leader, perceives a positive influence for the use of management control systems.

H_{1b}: The subordinate, under the command of a transformational leader, perceives a positive influence for the use of management control systems.

Key: MCS – Management Control System: limits system, diagnostic system, interactive system, and belief systems – Simons' four levers (1995).

Source: prepared by the authors (2023)

As this study was conducted in administrative units of the Brazilian Ministry of Health, it is believed that transactional leadership may have a greater positive influence on the use of MCS when compared to transformational leadership, due to the deep-rooted environmental dependences of its activities.

3 METHODOLOGICAL PROCEDURES

This study presents characteristics of descriptive research, conducted through a survey and quantitative approach. Data collection was performed using a questionnaire, as shown in Tables 1 and 2, and the response options were provided on a 7-point Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree).

The population and target audience comprise public officials with any connection to the Undersecretariat for Administrative Affairs (UAA), which is part of the Executive Secretariat of the Ministry of Health. This Undersecretariat was selected due to the fact that it is composed of units that provide various services and products, such as: planning and execution of organizational development actions focused on projects for standardization and improvement of work processes; management and supervision of administrative contracts; coordination of bidding processes for the acquisition of administrative supplies.

Contact with public officials was established via institutional or personal email addresses between June 2, 2022, and August 2, 2022, resulting in a sample of 72 respondents. It should be noted that, in order to capture the perceptions of subordinates regarding the leadership style of their superiors and the use of MCS, the research questions were adapted from Souza and Junior (2018) and Damke et al. (2011), respectively. These research instruments, in turn, are based on the theoretical models proposed by Bass and Avolio (1995) and Simons (1995), respectively.

It should be noted that convergent and discriminant validity and composite reliability indicated a positive evaluation of the adapted measurement model. The examination of the data and estimation of the theoretical model, developed from

a literature review, was performed using the Structural Equation Modeling (SEM) technique and the SmartPLS 3.0 software. Structural Equation Modeling (SEM) is a general multivariate statistical modeling technique used in the humanities and social sciences. Given the use of PLS-PM (Partial Least Squares Path Modeling) estimation, the statistical power was analyzed to determine the sample size to be used.

This analysis was performed using the G*Power 3.1 software, which, for two predictors (independent, explanatory variables), with a significance level of 5% (α err prob.), power of 80% (1-ß err prob.), and effect size f^2 of 15%, indicated a sample size of at least 68. It should be noted that the parameterized statistical power was 80%, which is the minimum value that ensures that type I (α) and type II (ß) errors are within acceptable values (Hair et al., 2005).

4 ANALYSIS AND DISCUSSION OF RESULTS

4.1 Characterization of the Sample and Respondents

The sample studied consisted of 72 respondents. Questions regarding the management control system and leadership style were answered in their entirety. It was made clear to respondents that there were no right or wrong answers and that the responses would represent the reality of the unit as perceived by the respondent.

In terms of the respondents' work units, 21 reported that they work in the General Coordination of Personnel Management (29.16%), 13.90% in the General Coordination of Materials and Assets, and 23.61% in the General Coordination of Budgetary and Financial Execution, which is equivalent to 66.67% of the sample. The most representative units in other areas were Documentation and Information (CGDI) and Monitoring and Execution of Administrative Contracts (CGCON), both comprising 11.11% of the sample.

Regarding the type of relationship with the staffing unit, 68.05% of respondents are permanent employees of the agency, representing 49 of the total 72. This profile of

respondents contributes to the interpretation of the survey results, especially in relation to the composition of the analyzed audience. The target audience comprises public officials with any connection to the UAA, since the control variable "respondent's relationship", included in the model, was not significant in relation to the predictor variable leadership, since the p values were 0.094 and 0.991 (significance occurs when p values ≤ 0.05).

In light of these results, it can be concluded that the model performs well both for employees with permanent contracts and for employees with other types of contracts (scholarship holders, commissioned employees, exclusively) in the units surveyed by the UAA/Executive Secretary/Ministry of Health.

In addition to the type of employment relationship, it was sought to characterize the profile of respondents through demographic questions related to their length of service at the unit where they work. This aspect is key to the questionnaire, since it is assumed that the longer the length of service, the greater the capacity of public officials to accurately assess and report on leadership practices and the use of the MCS.

From this perspective, it should be noted that 65.27% of respondents have been working in their respective units for six years or more, which is a positive indicator of the robustness of the responses, given that this period of activity suggests sufficient time to perceive the variables analyzed in this research. It should also be noted that only a small fraction of respondents (8.33%) have been working at the unit for less than a year.

Based on this temporal profile of the respondents, it is clear that public officials play a key role in the organizational management process; thus, the focus of this study requires an interpretation of the unit based on the perceptions of these employees. In this sense, it is worth noting that the data in this study are based on the perceptions of public officials who, having been involved in the work process for a considerable period of time, are able to understand the dynamics of their work environment.

In addition, the analysis of the length of service of managers in the respondents' units shows that 20.84% of leaders have been working in their respective units for

more than six years, while 48.61% have been working in their units for between one and five years. Given the relevant presentations to the respondents, the survey data will now be analyzed descriptively.

4.2 Descriptive Analysis

This study aims to organize and describe the collected data via descriptive analysis. As stated in the Methodology, a 7-point Likert scale was used in all statements that aimed to map perceptions of leadership style and the use of the management control system.

Statements A1 to A9 were used to map the belief system of the units studied, while statements A28 to A36 were used to map the interactive system, as shown in Table 1.

Table 1 – Descriptive Analysis of the Belief System and Interactive System

A	Belief System, which is used to inspire and guide the search for opportunities	mean	mode	standard deviation
1	The organization's vision and mission are communicated to all team members.	4.61	6	1.72
2	The organization has beliefs (aspects it believes in and trusts) that are widespread among the team.	4.79	4	1.45
3	The organization's vision, mission, and beliefs are clear to team members.	4.56	6	1.61
4	The shared beliefs describe the core values that are upheld by the team.	4.68	4	1.51
5	The beliefs provide guidance on the organization's purposes (the directions it wishes to follow).	4.81	4	1.49
6	The beliefs provide guidance on the behaviors to be performed in the search for opportunities for the organization and for my team.	4.65	6	1.61
7	The organization's beliefs form the basis for defining strategies.	4.73	6	1.59
8	The organization's beliefs help in the pursuit of its strategies.	4.88	5	1.52
9	The organization's beliefs contribute in times of change, guiding what the organization seeks to achieve.	4.58	5	1.61

Continues

Table 1 – Descriptive Analysis of the Belief System and Interactive System

Continuation

A	Interactive System, used to stimulate debate on premises and plans and allow new ideas and strategies to emerge	mean	mode	standard deviation
28	Superiors often engage team members in management activities.	4.59	5	1.56
29	Superiors invite team members to participate in decision-making at key moments.	4.65	5	1.78
30	Usually, superiors schedule face-to-face meetings.	4.80	6	1.74
31	Feedback from team members has already led to important and positive changes within the organization.	5.09	6	1.65
32	Superiors encourage new initiatives from team members to emerge.	4.81	5	1.68
33	There is formally a time or way for team members to collaborate with feedback on opportunities for the organization.	4.41	5	1.69
34	Superiors draw the attention of team members to strategic uncertainties, encouraging them to resolve them.	4.48	6	1.69
35	The participation of team members with suggestions is important so that strategies focus on the organization as a whole.	5.20	7	1.86
36	Superiors seek to stimulate organizational learning by sharing experiences and insights among team members.	4.86	5	1.71

Source: Research data (2022)

Key: 7-point Likert scale: 1 - Strongly disagree; 2 - Disagree; 3 - Partially disagree; 4 - Neither agree nor disagree; 5 - Partially agree; 6 - Agree; 7 - Strongly agree

In general, the findings indicate that the perceptions of followers regarding the leader's use of belief systems converge, on average, toward a similar view of the foundations that build this lever. However, it should be noted that the standard deviation of statements A1 was the highest, which statistically translates into a greater dispersion of responses in relation to the mean.

In any case, in all statements regarding the belief system, the mean was above 4.0, which shows, in general, that there is a shared perception of the use of the belief system in the Subsecretariat for Administrative Affairs, although not strongly extreme — that is, the perception of subordinates of this system is neutral, which shows an experience without high and low points.

Concerning the interactive system, although the perception of subordinates regarding their participation in the construction of a holistic vision strategy presents a mean higher than 5.0, it cannot be stated that this is an experience generally experienced by subordinates, given the high standard deviation for statement A35, which is 1.86; This understanding also applies to statement A29.

Table 2, in turn, compiles information on the limits system (A10 to A18) and the diagnostic system (A19 to A27). In the limits system, there are, on average, experiences with partial agreements (A10, A13, A16). Regarding the diagnostic system, the perceptions of the subordinates of the indicators, on average, indicate experiences without high and low points.

Table 2 – Descriptive Analysis of the Limits and Diagnosis System

A	Limits System, used to establish limits on the behavior of organization members	mean	mode	standard deviation
10	The organization has an ethics and conduct code, the contents of which are known to the team.	5.08	6	1.47
11	The organization disseminates its code of ethics and conduct to its teams.	4.87	6	1.66
12	The rules to be followed within the organization are formally communicated to the team.	5	5	1.60
13	The organization has clear rules.	5.08	5	1.40
14	The limits concerning freedom/autonomy are formally stated.	4.79	5	1.60
15	The limits declared by the organization guide team members, as they disclose the extent to which they can go.	4.73	5	1.65
16	The ethics and conduct code outlines the rules to be followed within the organization and the sanctions that will be imposed in the event of non-compliance with these rules.	5.11	6	1.57
17	The ethics and conduct code effectively punishes those who violate the organization's rules.	4.41	5	1.80
18	Immediate superiors publicly declare the boundaries to be respected within the organization.	4.70	5	1.63

Continues

Table 2 – Descriptive Analysis of the Limits and Diagnosis System

Continuation

A	Diagnostic Control System, whose purpose is to motivate, monitor, and reward the achievement of goals	mean	mode	standard deviation
19	The organization has systems in place to monitor results, i.e., supervisors effectively and periodically monitor the results achieved by the team.	4.41	5	1.70
20	Usually, numerous internal controls are applied within the organization to monitor activities.	4.38	6	1.67
21	The organization has clear goals and objectives.	4.76	5	1.60
22	These organizational goals and objectives are effectively and periodically monitored to ensure they are being met.	4.37	5	1.64
23	The organization has a formally disclosed planning.	4.58	5	1.59
24	Superiors evaluate whether what was planned has been achieved.	5.54	6	1.77
25	Superiors evaluate the behavior of each employee responsible for individual goals.	4.31	6	1.80
26	In cases where the target is not fully met, the organization allows for exceptions.	4.90	5	1.48
27	Superiors negotiate targets with team members based on reports and internal controls.	4.38	5	1.74

Source: Research data (2022)

Key: 7-point Likert scale: 1 - Strongly disagree; 2 - Disagree; 3 - Partially disagree; 4 - Neither agree nor disagree; 5 - Partially agree; 6 - Agree; 7 - Strongly agree

According to Table 2, the highest means were found in the limits system, which is not surprising given that public administration is governed by an enormous legal framework, including, among the principles that govern its activities, the constitutional principle of legality. While in private administration it is lawful to do whatever is not prohibited by law, in public administration it is only permissible to do what is authorized by law.

It is worth noting, however, that the means of the four control systems were close (ranging from 4.42 to 4.86). Considering the four control levers, the belief and limits systems showed the lowest dispersion, followed by the interactive and diagnostic systems (coefficients of variation of 33.19%, 33.12%, 36.05%, and 36.94%, respectively).

In addition, there were 19 statements designed to map the perception of transformational (A51 to A61) and transactional (A62 to A69) leadership styles from the perspective of subordinates.

Table 3 – Descriptive Analysis of Leadership

Latent variable (number of questions)	Mean	Mode	Standard deviation	Variation Coefficient
Transformational Leadership (11)	5.68	7	1.57	27.64%
Transactional Leadership (8)	5.18	6	1.76	33.97%

Source: Research Data

Key: 7-point Likert scale: 1 - Strongly disagree; 2 - Disagree; 3 - Partially disagree; 4 - Neither agree nor disagree; 5 - Partially agree; 6 - Agree; 7 - Strongly agree

As presented in Table 3, the perceptions of subordinates regarding leadership styles indicate a tendency toward both transformational and transactional leadership. However, it should be noted that transformational leadership presented less data dispersion, evidenced by a lower variation coefficient (27.64%).

4.3 Evaluation of the Measurement Model

In the verification that must precede the testing of the hypotheses proposed in the theoretical model, the measurement model is evaluated, that is, it is necessary to determine whether the latent variables were, in fact, adequately measured. For this purpose, convergent and discriminant validity, as well as reliability, were analyzed.

Regarding convergent validity, the average variance extracted (AVE) was calculated for each unobservable (latent) variable. All latent variables (LV) presented an AVE greater than 0.5, which is the minimum recommended value by Henseler et al. (2009), as shown in Table 4.

Regarding composite reliability (CR) - Dillon-Goldstein's ρ - and internal consistency (Cronbach's alpha), Cronbach's alpha (CA) was used, according to Ringle et al. (2014, p. 65), which "is based on intercorrelations of variables. CR is more

suitable for PLS-PM, as it prioritizes variables according to their reliability, while CA is highly sensitive to the number of variables in each construct".

In both cases, CA and CR are used to assess whether the sample is free of bias, or whether the responses, as a whole, are reliable. For this analysis, CA values above 0.60 and 0.70 are considered adequate in exploratory research, and CR values between 0.70 and 0.90 are considered satisfactory (Ringle et al., 2014). Table 4 shows that the CA and CR values are adequate.

In the study in question, it is noteworthy that, for Composite Reliability, the latent variables reached levels above 0.983. The resulting values for Cronbach's Alpha (internal consistency) ranged from 0.885 (transactional leadership) to 0.981 (transformational leadership). Therefore, it is clear that the values confirm the composite reliability and internal consistency criteria for the model through all of its latent variables.

Table 4 – Cronbach's Alpha, Composite Reliability of the Model, and Mean Extracted Variance

Variable	Cronbach's alpha	rho_A	Compound Reliability	Average Variance Extracted (AVE)
Transactional Leadership	0.885	0.906	0.910	0.564
Transformational Leadership	0.981	0.982	0.983	0.843
Diagnostic System	0.951	0.954	0.959	0.723
Interactive System	0.957	0.963	0.964	0.748
Belief System	0.950	0.955	0.957	0.712
Limits System	0.937	0.948	0.947	0.666

Source: Research data (2022)

Note: PLS – Algorithm, with a maximum of 300 interactions and Stop Criterion (10^-x) equal to 2.

In the context of evaluating the measurement model, discriminant validity, generated by the square root of the Mean Extracted Variance (MEV), enables the distinction between constructs by presuming unidimensionality, according to which a set of indicators represents a single latent variable, as per Structural Equation Modeling. In this sense, the evaluation of the discriminant validity (DV) of the SEM is understood as an indication that the latent variables are independent of each other, as proposed by Hair et al. (2005) and reinforced by Ringle et al. (2014).

Based on this understanding, the literature points to two main ways of assessing discriminant validity. One of them, according to Chin (1998), consists of observing cross loadings, in which indicators should present higher factor loadings in their respective latent variables than in others, as highlighted by Ringle et al. (2014).

Complementarily, another widely used criterion is that proposed by Fornell and Larcker (1981), which is operationalized by comparing the square roots of the AVE values of each construct and the correlations (Pearson) between the constructs or latent variables. According to this criterion, the square roots of the AVEs must be greater than the correlations between the constructs (Ringle et al., 2014).

In light of this criterion, as shown in Table 5, the discriminant validity assessed by the Fornell and Larcker (1981) method indicated that the correlation value between the latent variables transformational leadership and transactional leadership (0.829) is slightly higher — by 0.075 or 7.8% — than the square root of the AVE of the latent variable transactional leadership (0.751). Nevertheless, considering that the observed difference is relatively small, it was decided to keep the model without additional changes, as this does not compromise, in general, the discriminant validity established according to the criteria of Fornell and Larcker (1981), as discussed by Ringle et al. (2014).

Table 5 – Discriminant Validity - model by Fornell and Larcker (1981)

	Leadership		**System**			
	TS	**TF**	**DS**	**IS**	**BS**	**LS**
Transactional Leadership	0.751					
Transformational Leadership	0.829	0.918				
Diagnostic System	0.591	0.554	0.850			
Interactive System	0.695	0.640	0.642	0.865		
Beliefs System	0.379	0.359	0.559	0.519	0.844	
Limits System	0.468	0.475	0.635	0.542	0.744	0.816

Source: Research data

Legenda: TS – transactional leadership; TF – transformational leadership; DS – diagnostic system; IS – interactive system; BS – beliefs system; LS – limits system.

In addition, discriminant validity analysis was also performed using the cross-loadings criterion, as proposed by Chin (1998). It can be noted that the factor loadings of the observable variables (OVs) in their respective constructs (latent variables – LVs) are higher than the loadings presented in other constructs, which allows for the conclusion that the model also presents discriminant validity according to the Cross Loading criterion, as evidenced in Table 6.

Table 6 – Discriminant Validity - Cross Loading Criterion by Chin (1998)

	Leadership style		**Control system**			
	Transactional	**Transformational**	**Diagnostic (DS)**	**Interactive (IS)**	**Beliefs (BS)**	**Limits (LS)**
IC1	0.809	**0.923**	0.589	0.629	0.309	0.458
IC2	0.795	**0.924**	0.478	0.576	0.302	0.401
INS1	0.783	**0.933**	0.509	0.637	0.346	0.490
INS2	0.787	**0.962**	0.555	0.610	0.304	0.493
MAE1	**0.836**	0.833	0.471	0.652	0.365	0.417
MAE2	**0.559**	0.454	0.408	0.350	0.255	0.315
MAE3	**0.722**	0.616	0.434	0.373	0.291	0.275
MAE4	**0.554**	0.398	0.315	0.215	0.280	0.371
II1	0.759	**0.940**	0.479	0.582	0.333	0.410
II2	0.728	**0.924**	0.441	0.520	0.251	0.391
II3	0.690	**0.820**	0.380	0.587	0.314	0.348
II4	0.786	**0.951**	0.500	0.601	0.328	0.454
II5	0.752	**0.895**	0.553	0.568	0.353	0.386
MI1	0.726	**0.907**	0.517	0.564	0.390	0.466
MI2	0.746	**0.910**	0.565	0.576	0.386	0.473
CR1	**0.735**	0.532	0.350	0.598	0.176	0.251
CR2	0.846	0.735	0.519	0.661	0.292	0.446
CR3	**0.863**	0.656	0.446	0.668	0.255	0.372
CR4	**0.819**	0.633	0.569	0.507	0.353	0.350
BS1	0.396	0.278	0.397	0.378	**0.749**	0.551
BS2	0.328	0.344	0.436	0.352	**0.826**	0.653
BS3	0.372	0.366	0.492	0.403	**0.825**	0.669
BS4	0.334	0.385	0.475	0.470	**0.882**	0.658
BS5	0.269	0.200	0.504	0.520	**0.873**	0.574
BS6	0.231	0.272	0.568	0.444	**0.849**	0.622
BS7	0.235	0.212	0.374	0.437	**0.867**	0.538
BS8	0.309	0.292	0.466	0.462	**0.878**	0.674
BS9	0.312	0.288	0.523	0.493	**0.838**	0.644
DS1	0.431	0.420	**0.810**	0.516	0.394	0.464

Continues

Table 6 – Discriminant Validity - Cross Loading Criterion by Chin (1998)

Continuation

	Leadership style		Control system			
	Transactional	**Transformational**	**Diagnostic (DS)**	**Interactive (IS)**	**Beliefs (BS)**	**Limits (LS)**
DS2	0.485	0.483	**0.893**	0.546	0.514	0.604
DS3	0.486	0.383	**0.820**	0.589	0.691	0.589
DS4	0.540	0.535	**0.903**	0.538	0.508	0.546
DS5	0.426	0.356	**0.841**	0.462	0.429	0.499
DS6	0.506	0.471	**0.928**	0.560	0.435	0.554
DS7	0.522	0.559	**0.895**	0.562	0.396	0.605
DS8	0.550	0.482	**0.734**	0.512	0.449	0.471
DS9	0.532	0.493	**0.809**	0.603	0.459	0.509
IS1	0.627	0.546	0.519	**0.858**	0.442	0.518
IS2	0.637	0.573	0.555	**0.879**	0.357	0.434
IS3	0.536	0.431	0.424	**0.784**	0.302	0.269
IS4	0.510	0.430	0.631	**0.843**	0.485	0.403
IS5	0.694	0.697	0.626	**0.939**	0.493	0.543
IS6	0.565	0.566	0.622	**0.880**	0.523	0.513
IS7	0.630	0.591	0.568	**0.889**	0.554	0.578
IS8	0.525	0.482	0.487	**0.769**	0.460	0.521
IS9	0.650	0.605	0.564	**0.930**	0.423	0.411
LS1	0.391	0.312	0.445	0.375	0.461	**0.762**
LS2	0.311	0.246	0.361	0.429	0.525	**0.810**
LS3	0.327	0.297	0.423	0.419	0.608	**0.869**
LS4	0.438	0.405	0.601	0.506	0.710	**0.916**
LS5	0.369	0.430	0.514	0.430	0.644	**0.834**
LS6	0.411	0.445	0.634	0.423	0.717	**0.865**
LS7	0.286	0.319	0.413	0.369	0.557	**0.810**
LS8	0.336	0.321	0.514	0.344	0.524	**0.708**
LS9	0.467	0.551	0.606	0.582	0.618	**0.747**

Source: Research data

Key: Transformational leadership composed of IC - individual consideration, INS - Intellectual stimulation, II - idealized influence, MI - motivational inspiration; Transactional leadership composed of MAE - Management by active exception, CR - contingent reward; LS - Limits System; IS - Interactive System; DS - Diagnostic System; BS - Beliefs System.

In summary, as convergent and discriminant validity and composite reliability indicated a positive assessment of the measurement model, the study moved on to the analysis of the structural model.

4.4 Structural Model Evaluation

Initially, Pearson's coefficients of determination (R^2) were evaluated. R^2 values assess the percentage of variance in endogenous variables explained by the structural model; this analysis reveals the quality of the adjusted structural model.

In the fields of social and behavioral sciences, Cohen (1988) suggests that R^2=2% should be classified as a small effect, R^2=13% as a medium effect, and R^2=26% as a large effect (Ringle et al., 2014). It can be seen in Table 7 that for the diagnostic system and interactive system LVs, the R^2 values are large, for the belief system LV, they are medium, and for the boundary system LV, the R^2 is closer to a large effect.

Table 7 – R Square (R^2)

Variables	R Square – R^2
Diagnostic System	0.362
Interactive System	0.496
Beliefs System	0.150
Limits System	0.243

Source: Research data

Note: SmartPLS software, version 3.1.9.4; maximum interactions of 300, stop criterion (10 ^ - X) of 2, sample of 72 responses.

Regardless of whether the explanatory power is low, medium, or high, the results obtained via hypothesis testing reveal contributions to the field of leadership and the use of MCS. To test the significance of the relationships identified, the Bootstrapping module (resampling technique) was used, as highlighted in Table 8.

Table 8 – Path coefficients

		Original Sample (O)	Sample Mean (M)	Standard Deviation STDEV	T Statistics |O/STDEV|	P Values	Hypothesis
H1a	Transactional Leadership -> Diagnostic System	0.421	0.433	0.148	2.837	**0.005**	Accepted partially
	Transactional Leadership -> Interactive System	0.527	0.544	0.175	3.017	**0.003**	
	Transactional Leadership -> Beliefs System	0.259	0.329	0.229	1.130	0.259	
	Transactional Leadership -> Limits System	0.239	0.293	0.212	1.126	0.261	
H1b	Transformational Leadership -> Diagnostic System	0.205	0.197	0.147	1.401	0.162	Not accepted
	Transformational Leadership -> Interactive System	0.202	0.191	0.204	0.991	0.322	
	Transformational Leadership -> Beliefs System	0.144	0.081	0.286	0.506	0.613	
	Transformational Leadership -> Limits System	0.277	0.241	0.249	1.112	0.267	

Note 1: t-values and p-values estimated by bootstrapping with 500 resamples.

Note 2: Modeling performed according to recommendations by Ringle, Wende, and Becker (2015).

Values above 1.96 for the Student's t-test and a p-value equal to or lower than 0.05 validate the hypothesis in line with Hair et al. (2005). These analyses check the stability of the estimation measured by the software analysis. It is worth noting that the control variable respondent's employment status, included in the model, was not significant (significance exists when the p-value ≤ 0.05), as previously explained in Table 8.

4.5 Discussion of the Results

The hypothesis **"H_{1a}: The subordinate, under the command of a transactional leader, perceives a positive influence on the use of management control systems"** was not accepted in this study in relation to beliefs and limits systems, but was accepted in relation to diagnostic and interactive systems.

Regarding the diagnostic control system, this finding indicates that a transactional leader can be perceived as influential, in such a way that the use of the system also becomes evident. This is due to the fact that diagnostic control systems, which monitor organizational results, are essential levers for implementing planned strategies and generating feedback (Simons, 1995; Abernethy et al., 2010).

In this context, by making it clear to subordinates that their needs and expectations can be met through formally established exchanges, transactional leaders create incentives for employees to seek to maximize their performance, motivated by the achievement of their individual goals. As a result of this process, diagnostic control systems begin to be perceived by subordinates as central instruments for monitoring and evaluating results.

Thus, this transaction, which is legally possible, can be perceived by the subordinate as an opportunity for gain, or it can spark their awareness of the use of the diagnostic system, whose purpose can be perceived as a means for the leader to measure performance, in order to afterwards materialize their "currency" of exchange.

With regard to the interactive system, the finding, although contrary to what is recommended in the literature, is not surprising given the institutional nature of the units studied. In this context, perceived transactional leadership influences perceptions of the interactive system, given that the leader's management may be associated with the external political environment and the demands arising from it. It is worth noting that this perception may not be directly linked to issues stemming from challenges and institutional strategic alignment with the external environment, but rather to aspects related to possible changes in the activities of the researched units and, consequently, to expectations of possible changes in the rewards and exchanges provided for by the diagnostic control system.

Regarding the beliefs and limits systems, the results indicate that transactional leadership does not exert a significant influence on the perception of the use of

these systems, suggesting that this leadership style is not a relevant predictor for such control mechanisms in the context analyzed.

This evidence can be interpreted in light of the very nature of transactional leadership, which presupposes that leaders recognize the needs and expectations of their subordinates and explain how these can be met through exchanges linked to the performance of work roles (Bass & Avolio, 1990). It is, therefore, a leadership style strongly oriented towards clarifying individual rewards and responsibilities.

However, when considering limits systems from a public administration perspective, it can be noted that these mechanisms assume an institutionalized role, since they delimit acceptable behaviors and guide decision-making within a previously established regulatory framework. As argued by Simons (1995), limits systems function as organizational safeguards — analogous to the brakes on a vehicle — that allow for delegation and flexibility without compromising control.

In this institutional scenario, when transactional leaders make it clear to their subordinates that their needs and objectives can be met through formally established exchanges, employees tend to direct their efforts towards optimizing performance. However, in the public sector, the limits of action stem largely from legal norms, regulations, and procedures that are widely known by public officials. Thus, the perception of limits systems by subordinates is largely independent of the leadership style adopted, which helps explain the absence of a significant effect of transactional leadership on this type of control system in the model analyzed.

In terms of the beliefs system, this finding is not surprising and is consistent with previous literature, as the leadership style that, in theory, tends to nurture a system of shared values and norms is transformational (Gong & Subramaniam, 2020). Transactional leadership, by focusing primarily on rewards, punishments, and compliance with formal norms, tends to not affect the perception of the use of the beliefs systems, especially in the public sector, where institutional norms and bureaucratic

dysfunction strongly structure organizational values, reducing the perception of the transactional leader's influence on these shared systems.

Regarding the hypothesis **$H_{1b:}$ "Under the command of a transformational leader, subordinates perceive a positive influence on the use of management control systems",** The study confirms its non-acceptance in relation to the four control levers.

Transformational leadership tends to have a positive impact on organizational performance by promoting more skilled employees, who are granted greater autonomy and flexibility to challenge the status quo (Gong & Subramaniam, 2020), in addition to being a precursor to the interactive use of MCS (management control systems) (Cruz, 2014). Despite these theoretical premises, the results of this study indicate that, from the perspective of subordinates, transformational leadership does not have a direct and significant effect on the use of management control systems.

To understand this finding, it is necessary to examine the specific role of limits systems, which are used to define behavioral boundaries in the search for opportunities (Simons, 1995). Once the risks to be avoided have been identified, these systems establish limits through rules, codes of conduct, guidelines, and strategies, guiding organizational behavior and steering incremental innovation (Pletsch et al., 2016).

In this context, the limits system informs subordinates of what cannot be done, while granting them the freedom to innovate, explore, and create within a previously defined arena (Widener, 2004). However, in the public sector, rules and codes of conduct — implemented through a legal and regulatory framework — are intrinsic characteristics of organizational performance, defining this arena of action in advance. Thus, the transformational leader has a limited scope to set parameters for degrees of freedom, since regulatory restrictions exist regardless of the leadership style adopted, whether transformational or transactional.

With regard to the diagnostic system, it is worth noting that, in the public sector, there are careers that do not offer variable rewards (efficiency bonuses, performance

bonuses), as is the case with administrative careers in the units studied by the Undersecretariat for Administrative Affairs (UAA) of the Ministry of Health, whether at the assistant or intermediate levels, or at the senior level.

Therefore, when the premises of a transformational leader are perceived, the subordinates in the research units can understand that the leader's attitudes signal a management style that is more focused on training, empowerment, and offering motivational (non-financial) factors, rather than exchanges (transactional leader, in essence), which would then be measured through the use of the diagnostic system. In this trajectory of exchanges, transactional leadership and diagnostic systems would be better perceived by subordinates in contrast to transformational leadership, given that subordinates' interest in transactions outweighs empowerment and job training.

In relation to the beliefs system, leaders who adopt a transformational style tend to nurture a system of shared values and norms (Gong & Subramaniam, 2020). The organization's beliefs need to be understood by managers in order to be disseminated; furthermore, beliefs must be transformed into actions and strategies. Thus, managers can become enthusiastic participants in the search for opportunities (Simons, 1995).

However, if the basic values, purposes, and direction of the beliefs system, which are loaded with value, are not perceived, the inspiration for seeking and discovering, which is the purpose of the beliefs system (Mundy, 2010), ceases to exist, as extroversion and openness to experience are inherent characteristics of transformational leadership (Judge & Bono, 2000).

In this empirical context, the transformational leadership style in the units studied is not a significant predictor of the perception of the use of the beliefs system, which may indicate: (i) a disconnect between the leader's discourse and actions, (ii) the absence of strategic planning or its discontinuity, (iii) the absence of actions recommended by the beliefs system. Furthermore, although transformational leadership seeks to inspire, motivate, and align employees with organizational values and objectives, its influence on beliefs systems in the public sector may be limited.

This is due to the fact that such systems — shared values, norms, and premises — are strongly structured by formal rules, legislation, processes with excessive bureaucratic dysfunctions, and institutional culture, which may restrict the ability of transformational leaders to alter collective beliefs (Virtanen et al., 2024).

Regarding the interactive system, transformational leadership supports creativity and encourages employees to support the generation of more creative ideas in order to improve organizational processes. Thus, organizations should assist frontline supervisors and middle managers in developing transformational leadership (Tse et al., 2018). Furthermore, in order to be used interactively and act as a catalyst for new ideas and actions, a control system must be used by managers at various levels of the organization (Simons, 1995).

In light of this result, the rejection of the relationship between transformational leadership and interactive systems may indicate that, in the administrative units studied, interactive systems are not effectively used by leaders, according to their subordinates' perceptions. As a result, the study suggests that new ideas and technical contributions from subordinates tend to not be considered in the decision-making process conducted by transformational leaders.

However, this limitation cannot be attributed solely to the individual actions of the leader, since their actions are conditioned by higher hierarchical authorities and institutional restrictions. In this scenario, it is possible to notice the overlap of formal power — formally instituted — over *de facto* power, which reduces the leader's margin of discretion and compromises the effective use of the interactive system.

5 CONCLUDING REMARKS

Based on a survey conducted in the units that comprise the Undersecretariat for Administrative Affairs of the Ministry of Health, this study analyzed the perception of subordinates regarding the influence of transactional and transformational

leadership styles on the use of MCS, adopting the perspective of the subordinate, as recommended by the literature (Cruz, 2014; Samanta & Lamprakis, 2018).

The results indicate that transactional leadership has a direct, positive, and significant effect on the use of diagnostic and interactive management control systems. This finding is consistent with studies that point to the role of transactional leadership in structuring behaviors, directing actions, and engaging with formal control systems, both in the public sector and in other organizational contexts (Simons, 1995; Bass & Avolio, 1990; Hater & Bass, 1988; Abernethy et al., 2010; Oliveira & Klein, 2022; Khairy et al., 2023; Phan et al., 2024).

In contrast, transformational leadership was not confirmed as a precursor to the use of management control systems, including interactive and beliefs systems, a result that differs from previous studies (Cruz, 2014; Gong & Subramaniam, 2020). This evidence suggests that institutional, organizational, and contextual factors specific to the public sector — such as regulatory rigidity, low autonomy, and strong procedural orientation — may limit the manifestation and perception of transformational behaviors, as highlighted by classic and recent studies of public administration (Moynihan, 2008; Rainey, 2009; Peci & Sobral, 2007; Barreto & Rocha, 2020; Brunetto et al., 2017; Denhardt & Denhardt, 2003).

Additionally, the reduced activation of interactive and belief systems may be associated with the low exposure of the units analyzed to strategic uncertainties and the limited need for interinstitutional coordination, an aspect discussed in research on managerial control and public management (Mundy, 2010; Tavares et al., 2023; Lewis, 2024; Andersen et al., 2023). In this context, behavioral patterns closer to rational-instrumental logic may also contribute to the prevalence of transactional mechanisms, as discussed by Jones (2020) and Persky (1995).

As a contribution, this study broadens the understanding of the relationship between leadership styles and management control systems in the public sector, highlighting transactional leadership as a relevant predictor of the use of MCS, an

aspect that has yet to be empirically explored in this context (Abernethy et al., 2010). From a practical standpoint, the findings provide insights for the selection, training, and development of leaders in public organizations.

Among the limitations, the low response rate stands out — although the minimum sample size was met — as well as the restriction of the study to certain administrative units of the Ministry of Health, which precludes the generalization of the results. As a future research agenda, longitudinal and qualitative studies are suggested, as well as research in agencies whose careers have remuneration structures linked to organizational results and in contexts in which leaders are part of the career itself, reducing the influence of political appointments and interference.

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Contribution	[Author 1]	[Author 2]
1. Definition of research problem	√	√
2. Development of hypotheses or research questions (empirical studies)	√	√
3. Development of theoretical propositions (theoretical work)	√	√
4. Theoretical foundation / Literature review	√	
5. Definition of methodological procedures	√	√
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7. Statistical analysis	√	√
8. Analysis and interpretation of data	√	√
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Data availability statement

Data will be available upon request