Ambiguity in Public Sector Performance Measurement: a systematic literature review

Abstract

Purpose: This paper presents a systematic literature review (SLR) aiming at analysing how research has addressed Performance Measurement Systems (PMSs) ambiguities in the public sector. This paper embraces the ambiguity perspective that recognize that PMSs in public sector coexist with and cope with existing ambiguities.

Design/methodology/approach: We conducted our literature review in Scopus and ScienceDirect, considering articles published since 1985, and we selected articles published in the journals included in the Association of Business Schools' Academic Journal Guide (Chartered ABS 2018). Of the 1278 abstracts that matched our search criteria, we selected 131 articles for full reading and 37 articles for the final discussion.

Findings: The key findings of the study concern the main sources of ambiguity in PMSs discussed in the literature, their antecedents and their consequences. Our results suggest that ambiguity exists in performance measurement, and that is an issue to be handled with various strategies that can be implemented by managers and employees.

Research limitations/implications: Managers and researchers may benefit from this research as it may represent a guideline to understand ambiguities in their organizations or in field research. Researchers may also benefit from a summary list of the key issues that have been analysed in the empirical cases provided by this research.

Keywords: ambiguity, public sector, performance measurement, systematic literature review.

Article classification: research paper.

1. Introduction

Ambiguity is a lack of clarity and consistency in reality and in terms of causality and intentionality (Vakkuri and Meklin, 2006). This phenomenon is significant in the public sector, considering that the political environment produces multiple interpretations, uncertainty of meanings, unclear intentions, and conflicting goals.

In ambiguous situations, public managers try to simplify the world through Performance Measurement Systems (PMSs), which support managers in creating order in public policies, in managing activities, and in reducing ambiguity (Vakkuri, 2010; March and Olsen, 1987; March, 1994).

A PMS is defined as "the evolving formal and informal mechanisms, processes, systems, and networks used by organizations for conveying the key objectives and goals elicited by management, for assisting the strategic process and ongoing management through analysis, planning, measurement, control, rewarding, and broadly managing performance, and for supporting and facilitating organizational learning and change" (Ferreira and Otley, 2009, p. 264).

From an ambiguity perspective, the socialworld of decision-making and performance measurement is not completely rational (Davis and Hersh, 1986) and organizations are incapable of making completely rational decisions (Vakkuri and Meklin, 2006). Thus, despite public managers' efforts, their struggles for clarity, and their guesses about social interventions, ambiguity in performance measurement cannot be fully eliminated. Thus, ambiguity is something that decision-making and decision makers have to cope with (Vakkuri and Meklin, 2006).

Given the significance of ambiguity and PMSs in theory and in practice, our paper provides a systematic literature review (SLR) with the aim of analysing how research has addressed PMS ambiguities in the public sector to date. We will try to answer the following three research questions:

- What are the main types of ambiguity in public sector PMSs disclosed in earlier literature?

- What are the main *antecedents* – i.e., factors that favour or limit the emergence of ambiguities – and *consequences* of ambiguities in terms of effects on performance measurement?

- Which main critiques can be identified in previous research?

We conducted our literature review in Scopus and Science Direct, considering articles published since 1985 and listed in these databases. The review includes papers that deal with the goals and missions related to organizational and individual performance, as well as papers dealing with key knowledge related to the psychological and emotional aspects of the job. Specifically, we are interested in the aspects employees have to face to successfully complete job tasks and achieve their goals (Bandura, 1977; Rizzo et al., 1970; Van Sell et al., 1981). Considering this, ambiguities have been classified into ambiguities in PMS objectives and ambiguities in individuals' perceptions. The latter are associated, for example, with individuals' work or with perceived role conflicts, and with the psychological and emotional aspects of the job, which, in turn, affect performance.

The key findings of the study concern the sources of ambiguity in PMSs that have been discussed in the literature. Our results suggest that ambiguity remains a significant problem in performance measurement, which cannot be fully solved; therefore, researchers and public managers need to understand it properly. This paper also summarizes the antecedents and consequences of ambiguity in the public sector, providing knowledge and practical insight to assist public managers in coping with PMS ambiguities in public organizations.

Finally, the paper identifies critiques in previous research, which generate theoretical implications and suggest possible areas for future research regarding the theory of ambiguity and performance measurement.

The remainder of the paper is organized as follows: Section 2 explains the theoretical notion of ambiguity in public organizations; Section 3 describes the research method; Section 4 explicates the findings related to the types of ambiguity, their antecedents, consequences and measurements in PMSs; and the last section discusses the key findings and contributions of the study.

2. Theorization of ambiguity and performance

This section provides a brief theoretical explanation of the notion of ambiguity in performance measurement and decision-making, and a definition of performance.

According to a rational perspective, accounting is seen as a "rationalization machine" (Burchell et al., 1980), where sophisticated performance measurement methodologies and techniques, standards and indicators may eliminate ambiguity (Kaplan, 2009; Brown et al., 1993).

In contrast, the ambiguity perspective argues that the social world of decision-making and performance measurement is not completely rational (Davis and Hersh, 1986); therefore, sophisticated PMSs do not necessarily ensure their competent managerial use (Vakkuri, 2003).

In the public sector, different issues create ambiguity in performance measurement. First, changes in the environment create new goals and make PMSs obsolete; these changes may arise from new political mandates and evolving political interest and institutional logics (Grossi et al., 2018; Modell, 2021), politicians' efforts to generate political compromise (Dahl and Lindblom, 1953; Wilson, 1989), or urgent matters and unexpected needs to face (Cinquini et al., 2017). Second, policy implementation creates ambiguities: in fact, implementers have considerable discretion or agency at local level in deciding how policies will be implemented (Barrett, 2004), especially if there is no clear and explicit blueprint for policy implementation (Wallace et al., 2006). Third, performance measurement assumes a consequential logic of cause and effect between actions and performance, but does not consider the actors' interpretations, reactions and conflicts (Kaplan and Norton, 1996; Bevan and Hood, 2006; Vakkuri, 2010; March and Sutton, 1997). Interpreting data and understanding cause-effect relationships between public interventions, invested funds, and performance is highly complicated (March 1987). There is a dynamic interaction between PMSs and institutional logics that contributes to shape institutional fields over time (Modell, 2021). PMSs can reshape the objects of evaluation and create new social realities, while such practices can result from institutionalised novel concepts of performance (Modell, 2021). Implementing a PMS is not simply using an application according to a framework in a textbook; rather, it depends on the interpretations the relevant actors

involved give (Vakkuri, 2010; Grossi et al., 2018) and on the interactions among actors that reshape performance measurement tools (see Aidemark, 2001; Johanson et al., 2006), thus creating a sort of ambiguity of interpretation. The definition of objectives, measures and resources in social modelling is the result of a complex social negotiation process (Grossi et al., 2018).

Regardless of how difficult it is to eliminate ambiguity, public managers striving for clarity try to guess which social interventions are necessary. The relevant question we are addressing here is how they approach ambiguity and performance measurement (Lindblom, 1959; March and Olsen, 1987; Moynihan, 2002). In this respect, research has found that certain actors try to take advantage from ambiguity. For example, ambiguous goals allow organizations the necessary flexibility to adapt to environmental change and uncertainty (Maynard-Moody and McClintock, 1987) or to (re-)interpret goals in ways that are likely to meet the expectations of diverse bodies of politicians and citizens (Maynard-Moody and McClintock, 1987; Moore, 1995). Another strategy to take advantage from ambiguity is when employees use ambiguity to "tailor their interpretations of the directive to their differing work functions" (Barley et al., 2012, p. 284, citing Keleman, 2000) and gain greater job autonomy and discretion (Baier et al., 1988; Ginger, 1998; Meyer et al., 2004). Ambiguity can also facilitate collaboration between organizational members working on different tasks (Barley et al., 2012; Eisenberg, 2007; Gioia and Chittipeddi, 1991) and can support top managers to informally assess performance and gain flexibility in a changing environment (Cinquini et al., 2017).

Our research accepts a broad definition of performance that considers both organizational performance goals adopted in performance evaluation systems and the psychological and emotional aspects of performance, such as job satisfaction and turnover intention (Taylor, 2013). In fact, employees who experience anxiety, depression, tension, anger and fear (Kahn et al., 1964; Rizzo et al., 1970) and occupational stress can, in turn, have low job performance and increased staff turnover and absenteeism (Bandura, 1977; Rizzo et al., 1970; Van Sell et al., 1981).

3. Method and database

This paper takes a SLR approach to the collection of a research dataset referring to the types of ambiguity found in the assessments conducted in public sector organizations. This methodology has allowed us to provide a comprehensive view of the literature stream on the topic and shape directions for future research from published articles (Pettycrew and Roberts, 2006). Further, the SLR approach allowed us to critically evaluate the existing literature focusing on a specific theme and identify gaps and suggestions for future research (Massaro et al., 2016; Bracci et al., 2019). SLR has been broadly used in various accounting fields, such as in the study of consolidated financial statements (Santis et al., 2018), intellectual capital (Dumay et al., 2015; Bisogno et al., 2018), non-financial reporting

(Manes-Rossi et al., 2020), integrated reporting (Dumay et al., 2016), and public value (Bracci et al., 2019) in the public sector.

We selected peer-reviewed journals highly ranked according to the rating system of the Chartered Association of Business Schools' "Academic Journal Guide 2018". We conducted the journal selection process in all the fields included in the guide. Since PMS implementation in the public sector started in the mid-1980s, we considered articles published in the period from 1985 to mid-2020. In the literature search step, researchers selected the databases in which to perform the literature search, and Scopus and ScienceDirect were considered as additional sources. We then developed the following list of six keyword pairs: "ambiguity" and "performance", "ambiguity" and "measure", "ambiguity" and "performance measure*", "ambiguity" and "public sector", "ambiguity" and "management accounting", "ambiguity" and "accounting". We defined broadly applicable keywords that enabled the collection of a broad stream of literature (not limited to the public sector). The search was conducted in the article title, abstract, and keywords.

We included papers that discussed the relationship between ambiguity and performance (as defined in Section 2) and papers on the relationship between ambiguity and employees' emotional and psychological predisposition regarding organizational and individual performance. We also considered papers on self-efficacy, i.e., on people's beliefs about their capability to control events that affect their lives. Despite adopting a broad definition of performance, we excluded papers on issues that were far from performance, such as research generally covering the topic of ambiguity without specific reference to a structured and detailed research framework or articles referring to typical public services studied in private contexts.

Table 1 presents the screening of results and the selection of articles.

Table 1 here

We summarised each of the 37 papers by developing the following framework of analysis, consisting of ten information categories based on existing SLR studies (Dumay et al., 2016, Massaro, 2016; Santis et al., 2018, Bisogno et al., 2018; Manes-Rossi et al., 2020): (A) journal, (B) Academic Journal Guide 2018 area, (C) publication year, (D) Authors' research question(s), (E) Ambiguity perspective, (F) Research methods, (G) Country of research, (H) Organizational setting of research, (I) Findings, and (J) Future research suggestions.

We coded the item features while synthesizing the contents of the various papers by using the aforementioned framework to identify the characteristics of the articles. We then identified the common topics emerging from the selected articles through a thematic analysis (Braun and Clarke, 2006; Vaismoradi et al., 2013). We considered thematic analysis to be suitable for exploring the

literature on ambiguity in the public sector because it highlights the common themes covered in the selected articles. In this study, themes coincided with the different types of ambiguity. We, therefore, grouped the findings on the basis of the emerging themes and categories (Vaismoradi et al., 2013). Finally, we presented future research directions suggested in the articles of the past 15 years and highlighted the topics future research should address.

The results produced by our literature review confirmed that our topic is of interest, even if the number of published papers is limited. Table 2 summarizes the 37 papers in the dataset according to number of articles, type of journal, and sector of the journal.

Table 2 here

The investigation methods adopted in the selected papers to address their research questions mainly took a quantitative research approach (28 out of 37 articles). Most of the papers made statistical inferences on questionnaire data they had collected and analysed. Two research works performed a data analysis by using a structural equation modelling approach (Calciolari et al., 2011; Stazyk and Davis, 2020).

Eight papers adopted a qualitative approach, and addressed their research questions through literature reviews (Matland, 1995), conceptual discussions (Modell, 2004; Vakkuri and Meklin, 2006; Rainey and Jung, 2015), or case studies (e.g., Oppi and Vagnoni, 2020). One study adopted a quali-quantitative methodology(Arnaboldi and Lapsley, 2009).

4. Findings: types of ambiguity, antecedents, consequences, measurements and unresolved issues

This section deals with the main types of ambiguity identified in public sector PMSs in the literature and considers the effects of these ambiguities and their main antecedents. This section also indicates the future research directions identified by researchers. A group of studies have investigated ambiguity in connection with policies and PMS implementation processes, while another group investigated ambiguity in goals, and a third group focused on the perception of ambiguity by individuals. Table 3 summarizes the different types of ambiguity and the related perspectives, while the following sub-sections describe the findings according to these perspectives. The following sub-section provide some key insights on the various dimensions of ambiguity (deeper details are provided in Table 4).

Table 3 here

4.1 Ambiguity in objectives

a) Ambiguity in implementation of policies and performance measurement systems

Ambiguity may regard policy implementation. The way policies are implemented may determine conflicts and ambiguity.

We may recall an interesting study by Matland (1995), who described four paradigms for the implementation of policies in the public sector and the related conflicts. These paradigms are: (i) low conflict-low ambiguity (administrative implementation) – this is when the outcomes of a policy are affected by the availability of resources, and the implementation strategies required to achieve the desired results are clear; (ii) high conflict-low ambiguity (political implementation) – in a top-down approach, policy-makers determine the outcomes and recipients do not agree on the objectives; (iii) high conflict-high ambiguity (symbolic implementation) – when the results of implementation processes rely on the recipients' attitudes to the policies at local level; and (iv) low conflict-high ambiguity (experimental implementation) – in a bottom up approach where the implementation process depends on the conditions of the context and on the participation of the actors.

According to this matrix, Arnaboldi and Lapsley (2009) and Arnaboldi and Palermo (2001) underlined that ambiguity is exacerbated when policy implementation follows a top-down approach that does not consider the point of view of the various stakeholders (Lawton et al., 2000; Modell, 2004), but applies the same set of indicators to all organizations without considering the specificity of the context (Pilonato and Monfardini, 2020), and local decision makers receive little information. These authors suggest that an interactive approach in policy implementation could support compliance with the organization's specifications.

When discussing ambiguity in PMS implementation, earlier research argues that it may depend on the actors' involvement (Vakkuri and Meklin, 2006). For example, managers' values may influence how performance is perceived and shape how tools and attitudes are designed and used; thus, they can increase or reduce ambiguity. Also, contingency factors such as the availability of financial resources, political support and the complexity of managerial tools can affect ambiguity in PMS implementation.

b) Organizational goal ambiguity

Organizational goal ambiguity is "the extent to which an organizational goal or set of goals allows leeway for interpretation, when the organizational goal represents the desired future state of the organization" (Chun and Rainey, 2005a).

Goal ambiguity in performance measurement and the ambiguities in PMSs cannot be fully resolved (Vakkuri and Meklin, 2006; Barley et al., 2012). Nevertheless, the importance of deepening the ambiguities associated with PMS objectives in the public sector, and how literature has defined

them, gained relevance considering their negative effect on performance and other significant issues relating to performance.

In fact, organizations with unclear goals perform worse than organizations with a strong hierarchical authority, formalized rules, procedures and practices (Stazyk and Goerdel, 2011), and limited discretion at lower levels. When the assessment process of goal achievement, target, priorities and timing is uncertain, negative consequences arise in terms of performance evaluation and understanding: stakeholders do not understand performance, managers do not communicate effectively and do not achieve satisfactory levels in understanding performance (Jung and Rainey, 2011, 2014a; 2014b), customer service orientation is difficult, productivity and work quality decrease (Chun and Rainey, 2005b).

Organizational goal ambiguity has other negative consequences, such as increased role ambiguity (Stazyk et al., 2011; Davis and Stazyk, 2015), increased conflicts and turnover intentions, decreased employee motivation (Jung, 2012b; Jung, 2014a; Jung and Rainey, 2011, Calciolari et al., 2011; Wright, 2004) and job satisfaction (Jung, 2011; Jung 2014b), and increased turnover intention (Jung, 2012b).

Researchers have extensively investigated PMS goal ambiguities, as we will see below. First, we will present the types of ambiguity that have been most frequently investigated in terms of number of papers. Then, since different types of ambiguity overlap and are interconnected with one another, we will separately report on each peculiarity identified.

The notion of goal ambiguity has been investigated in terms of its antithesis, goal clarity (Pandey and Rainey, 2006; Stazyk and Goerdel, 2011; Stazyk et al., 2011; Sun et al., 2014; Davis and Stazyk, 2015; Stazyk and Davis; 2020), which is "the extent to which an organization's goals and objectives are tangible and unambiguous" (Baldwin, 1987; p. 186). Goal clarity is affected by political support and organizational structure, although with contrasting effects (Calciolari et al., 2011; Pandey and Rainey, 2006; Stazyk et al., 2011; Davis and Stazyk, 2015). Political support will increase goal clarity if managers interact with politicians who clarify the goals and mission of public agencies and increase their performance (Pandey and Rainey, 2006; Stazyk and Goerdel, 2011). Organizations that centralize decision-making processes also experience high levels of goal clarity (Stazyk et al., 2011), but only for managers who are involved in such processes. Conversely, goal clarity is reduced for lower level managers and employees who are not involved in decision-making processes (Pandey and Rainey, 2006). Internal communication also seems to be a key investment to increase goal clarity, when aimed at improving mission comprehension (Pandey and Rainey, 2006) and at specifying rules and procedures (Stazyk et al., 2011).

Last antecedents of goal clarity are managers' attitudes and employees' perceptions. Managers who assume the characteristics of "transformational leaders" clarify goals and foster employees' commitment to public values, and raise their collective sense of self-efficacy (Stazyk and Davis, 2020). Employees who perceive positive interaction dynamics with colleagues and supervisors increase learning and perceive less ambiguities (Sun et al., 2014). Role ambiguity (experienced when individuals lack role-relevant information; Rizzo et al., 1970), also increases perceptions of goal ambiguity, or alternatively requires higher tolerance of ambiguity (Pandey and Rainey, 2006).

Ambiguity in PMS objectives also applies to evaluative goal ambiguity, which is the level of interpretive leeway a goal allows in evaluating the progress towards its achievement (Chun and Rainey, 2005a; Jung, 2012a; 2012b; Lee et al., 2010).

Financial "publicness" (public funding received through government allocation, that extends the performance goals), political salience (i.e., garnering political authorities' attention), policy problem complexity and organizational complexity exacerbate evaluative goal ambiguity (Chun and Rainey, 2005a; 2005b; Lee et al., 2010; Rainey and Jung, 2015). In addition, public organizations with regulatory mandates, which tend to be general and vague, report greater difficulties in measuring the degrees of progress towards achieving the goal (Chun and Rainey, 2005b). Also, PMSs that focus on output (or process) measures increase evaluative goal ambiguity due to the prominence of rules and procedural compliance demands (Jung, 2012b; 2014a).

Conversely, high levels of managerial capability enable organizations to develop clear objectives and clear measures, reducing evaluative goal ambiguity (Rainey and Jung, 2015). Programmed tasks, routines and structured technologies also reduce this ambiguity (Chun and Rainey, 2005b; Lee et al., 2010).

Priority goal ambiguity is "the level of interpretive leeway in deciding priorities among multiple goals" (Chun and Rainey, 2005a, p .4). The main antecedent of priority goal ambiguity is the variety of goals. A high number of goals (Jung, 2011) or uncoordinated goals (Modell, 2004) complicates the identification of priorities and leads to conflict about which goals should be primarily addressed (Lee et al., 2010). As for evaluative goal ambiguity, political and institutional antecedents, such as financial publicness and political salience, also affect priority goal ambiguity (Rainey and Jung, 2015; Chun and Rainey, 2005b).

The effects of these antecedents could be mitigated by the type of policy responsibility: regulatory public organizations present lower levels of priority goal ambiguity, as they often have a narrower goal than non-regulatory organizations (Rainey and Jung, 2015). In the public healthcare sector, low measurability of goals can lead to priority goal ambiguity (Calciolari et al., 2011).

Ambiguity also refers to target-specification and time-specification goal ambiguity. Target-specification ambiguity refers to lacking concreteness and quantification of objectives, or lacking quantitative or qualitative targets (Jung, 2011; 2012a; 2014a; 2014b). Specific goals, rather than vague guidelines such as "do your best", allow employees to determine how much and what type of effort is required to achieve their objectives (Jung, 2011; 2012b; Jung and Rainey, 2011).

Time-specification goal ambiguity is "the lack of clarity in deciding on the distinction between annual and long-term performance goals" (Jung, 2011, p. 199). It can emerge when managers have difficulties in predicting short-term objectives for long-term goals (Jung, 2012b). Consequently, ambiguity emerges in arbitrary decision-making processes regarding the actions to be taken (Jung, 2014a).

Chun and Rainey (2005a) introduced directive goal ambiguity, defined as "the amount of interpretive leeway available in translating an organization's mission or general goals into directives and guidelines for specific actions to be taken to accomplish the mission" (p. 3). It is associated with financial "publicness" (Chun and Rainey, 2005a; 2005b; Rainey and Jung, 2015) and public organizations' broad mandates (Rainey and Jung's; 2015). Task complexity also emerge as an antecedent: employees responsible for complex tasks, who receive less specific directives, experience higher directive goal ambiguity compared with those dealing with relatively routine tasks (Lee et al., 2010). Additionally, young organizations face higher directive goal ambiguity because policy mandates evolve towards more specific and detailed goals over time (Majone and Wildavsky, 1984). Interestingly, this contrasts with the findings on priority goal ambiguity.

The last type of ambiguity connected to PMS objectives is goal conflict. An example of goal conflict is when certain goals prevent others from being achieved (Wright, 2004).

4.2 Ambiguity in individuals' perceptions

a) Role ambiguity

Ambiguity also emerges in the individuals' perceptions of roles and tasks. This perspective relates to role ambiguity, mission comprehension ambiguity, and tolerance of ambiguity. In the literature, researchers have explored the antecedents and consequences of these individual ambiguity perceptions, sometimes also considering their relationship to ambiguities in PMS objectives (e.g., Pandey and Wright, 2006; Pandey and Rainey, 2006; Chun and Rainey, 2005a; 2005b).

The direct and indirect consequences on performance are significant. Regarding consequences, these refer to employees' organizational commitment and job satisfaction, which, in turn, might be significant in terms of their effect on performance.

Main consequences include: increased employees' turnover intentions (Stazyk et al., 2011), dissatisfaction, sense of losing control at work, perceptions of poor work quality, low productivity, frustration, and a weakened psychological contract with and among employees (Pakarinen and Virtanen, 2016), employees' affective commitment (identification with organizational goals), and value and normative commitment (sense of obligation to the organization) (Addae et al., 2008; Reid et al., 2008; Baraldi et al., 2010). We may also recall reduced job satisfaction (Reid et al., 2008; Jung, 2014) and reduced employee empowerment (Skrinou and Gkorezis, 2019).

Role ambiguity occurs when employees barely understand what their work demands of them in terms of tasks, role and expected behaviour (Rizzo et al., 1970; Scott, 2008).

One of the antecedents of role ambiguity is related to the organizational structure (e.g., the matrix organizational structure): when it generates an imbalance between responsibility and power and creates a need for multiple reporting relationships, conflicting expectations, excessive demands, role overload or authority conflicts (Pakarinen and Virtanen, 2016), it increases role ambiguity.

Also, the quality of communication can affect such ambiguity: high quality communication between supervisors and subordinates and between colleagues can reduce role ambiguity (Brunetto et al., 2011; 2012). Improving communication quality emerges as a solution to reduce role ambiguity, together with role specification, clear work distribution between central administration and managers, task prioritization and coordination (Pakarinen and Virtanen, 2016).

Further role ambiguity antecedents can be found in the external context. For example, in healthcare, role ambiguity emerged when reforms shifted the management model from the public sector model to an outcome-based model (Brunetto et al., 2011; 2012) or followed coercive regulation and centralized managerial functions (Oppi and Vagnoni, 2020).

Goal ambiguity is also an antecedent of role ambiguity (Pandey and Wright, 2006): when organizations implement control mechanisms based on output to reduce goal ambiguity, they can, in turn, increase role ambiguity.

b) *Mission comprehension ambiguity*

Mission comprehension ambiguity refers to how comprehensible the organizational mission is. It relates to "the level of interpretive leeway that an organizational mission allows in comprehending, explaining, and communicating the organizational mission" (Chun and Rainey, 2005a, p. 3). Antecedents of mission comprehension ambiguity are related to the goal characteristics, based on the ambiguities in PMS objectives such as evaluative goal ambiguity and priority goal ambiguity (Chun and Rainey, 2005a).

c) Tolerance of ambiguity

Tolerance of ambiguity is mainly defined as an individual's ability to respond positively to ambiguous situations (Teoh and Foo, 1997) or to unfamiliar or complex stimuli, such as new, complex and contradictory situations (Tsirikas et al., 2012). Tolerance of ambiguity has frequently been associated with its antithesis, intolerance of ambiguity (Budner, 1962).

Employees at different levels have exhibited various degree of tolerance of ambiguity. Some actors rely on ambiguity to do their job pro-actively and skilfully utilizing the ambiguity associated with PMSs to advance various interests in reciprocal interplay with their institutional context (Modell, 2004; Vakkuri and Meklin, 2006). For example, top managers could feel more comfortable with ambiguous PMSs, because this ambiguity helps them manage complex and changing environments. Also, managers appointed by politicians can take advantage of ambiguous goals to be compliant with changing priorities and goals (Cinquini et al. 2017). Managers or professionals who are assigned complex roles usually show a greater tolerance of ambiguity because they have been trained or are more flexible in responding to environmental changes (Pandey and Wright, 2006). Lastly, managers who can use new knowledge management tools experience a higher tolerance for ambiguity, which can significantly affect workers' productivity levels (Tsirikas et al., 2012).

Overcoming ambiguity depends on the managers' ability to clearly define employees' roles and organizational expectations and build mutual trust and respect. A proper attention to avoid conflicts and ambiguity in subordinate work roles could increase job efficiency and effectiveness, and thus reduce role ambiguity.

Table 4 below summarizes the specific antecedents and consequences of the types of ambiguity discussed above, with the related references. The arrows show the antecedents' positive (↑) or negative (↓) impact on these ambiguities, and their consequences. As it is normally dealt with in the literature, we are reporting on goal clarity in its positive meaning. Table 4 also lists how the different types of ambiguity were empirically investigated, for example which kind of questions, analysis or measurements have been used to empirically assess the existence of ambiguity. Although most of the papers we investigated are based on quantitative analysis, some questions could also be developed for implementation in qualitative case studies.

Table 4 here

Finally, we explored future research directions in the recent literature, considering the papers published between 2006 and 2020. More specifically, we identified some unsolved issues regarding ambiguity in PMS objectives and ambiguity in individuals' perceptions.

Considering the former, our review highlights a need for further research on the definition of the notion of ambiguity, and the related antecedents and consequences. For instance, Rainey and Jung (2015) encouraged future researchers to identify appropriate goal clarity levels for different conditions and settings. They suggested "goal validity" as a notion to be investigated to determine "when a goal or a performance measure provides a valid indication of appropriate results" (p. 90).

Referring to goal clarity antecedents, Calciolari et al. (2011) suggested that research should investigate how managers' skills may help to interpret and clarify goals, thus reducing goal ambiguity. Focusing on employees' perceptions, Sun et al. (2014) encouraged future researchers to understand how patterns of clear organizational goals and missions develop in public organizations, also focusing on the effects of goal ambiguity at different organizational levels. Davis and Stazyk (2015) suggested exploring whether higher perceptions of political support can reduce goal ambiguity and addressed employees' absenteeism and turnover intentions. Furthermore, Stazyk and Goerdel (2011) suggested that research should focus on the role of hierarchical authority in mediating external environmental uncertainty.

Considering the consequences of goal ambiguity, Jung (2014a) called for research to test different ambiguities on specific performance dimensions. Furthermore, Jung (2014b) suggested that research could assess the role of certain mediating aspects, such as organizational identification, leadership support, and organizational culture, with respect to goal ambiguity and job satisfaction. This could enhance job satisfaction and morale, while reducing turnover intention and actual turnover, thus improving individual and organizational performance.

Directions for future research on ambiguity in individuals' perceptions mainly refer to role ambiguity. In particular, Oppi and Vagnoni (2020) suggested that research should investigate institutional and organizational factors, as well as accounting characteristics and information systems that can reduce ambiguity. Other authors recommended further analysis of the consequences of role ambiguity regarding work characteristics, job satisfaction and employee empowerment (Reid et al. 2008; Addae et al., 2008; Skrinou and Gkorezis, 2019). They encouraged research on the role of the relationship between supervisors and subordinates in enhancing ambiguity (Brunetto et al. 2011; 2012). Regarding tolerance of ambiguity, Tsirikas et al. (2012) suggested an in-depth analysis of the personality of managers as a source of ambiguity.

5. Discussion and conclusions

This literature review addressed three research questions: which main types of ambiguity in public sector PMSs are dealt with in earlier literature; what are the main antecedents and consequences of ambiguity in the public sector; and which are the main critiques in previous research.

Concerning the main types of ambiguity in PMSs, the earlier literature mainly focused on goal clarity and role ambiguity, with only a very small number of papers covering directive goal ambiguity, target-specification and time-specification ambiguity. Among the ambiguities in individuals' perceptions, tolerance of ambiguity has been studied and discussed in only two papers. Moreover, other important types of ambiguity do not appear in our literature review despite being significant in the public sector. We refer, for example, to environmental uncertainty, and the ambiguity related to political influence, multiple stakeholders' influence, and a changing environment (Cinquini et al., 2017). Task uncertainty has also not been investigated in the papers we considered, although it is often implicitly included in the study of role ambiguity. Similarly, managerial ambiguity in the public sector deserves more attention.

The papers we selected for our review did not explicitly take goal types into account. For instance, Perrow (1961) emphasized the differences between various types of goals distinguishing between official goals that reflect the general aims of the organization (i.e., the mission) and operating goals that indicate the actions to be taken. Therefore, future research should investigate the types of ambiguity that currently seem to be underexplored and more directly examine the interplay between the different types of ambiguity and the types of goals.

Concerning the second research question, by understanding ambiguities in PMSs, their antecedents and their consequences, practitioners and researchers could gain insight on which are the most suitable actions to understand and cope with ambiguities, even if they cannot be fully resolved (Vakkuri and Meklin, 2006; Barley et al., 2012). Table 4 offers a particularly helpful guideline for continuing research in the field of ambiguity in the public sector. Identifying future research directions may also support scholars in recognizing unexplored topics.

Regarding the third research question, we summarized the main issues emerging from previous research. One set of critiques relates to the approaches to ambiguity adopted in the existing literature. With a few exceptions, all empirical papers adopted a technical approach to investigate ambiguities and did not interpret results in a broader discussion of the conceptualization of ambiguity in the public sector. Many of these papers measured the effects of a few ambiguity dimensions on performance, or vice versa. However, the authors explicated neither their concept of ambiguity nor their understanding of ambiguity as a theoretical concept. While these papers could provide good or useful results, their findings would benefit from the inclusion of a broader notion of ambiguity. For example, earlier research seems to consider ambiguity as something that can be solved by a technical performance measurement instrument. However, performance measurement is an outcome of creative human action and depends on the interpretations of the various actors and on the interaction between actors (Vakkuri, 2010; Johanson et al., 2006).

Furthermore, we found no studies investigating the possible advantages actors can obtain by relying on ambiguity. In fact, ambiguity, especially if referred to goals, provides a greater autonomy and discretion in the workplace to the players in their various roles.

Lastly, the papers included in the SLR predominantly used a positivist or interpretive view of performance measurement, without any attempts to stimulate change. Conversely, critical studies are required to support change in organizations. For example, we miss proposals on how the *status quo* could be changed or ambiguities could be managed. Considering that public managers largely guess which social interventions are required as they strive for clarity, the important and unanswered question remains of how to approach ambiguity and performance measurement, as suggested by Lindblom (1959), March and Olsen (1987) and Moynihan (2002).

Future research directions stem from the above considerations. One is related to investigating the capacity of managers to recognize and manage ambiguity, and to interpret and manage organizational and individual performance in an ambiguous context. Another refers to the management of such situations by employees, as well as to the strategies that should be adopted to prevent employees' resistance and opportunistic behaviour. Future research is also needed to identify employees' approaches and strategies to deal with ambiguity. Finally, considering the ambivalent effect of ambiguity on people in organizations, future empirical studies may focus on the "beneficial" use of ambiguity in workplaces.

Regarding the limitations of this study, the findings highlighting goal ambiguity have mainly been drawn from research settings of the U.S. federal agencies with civil servants. This situational limitation opens an avenue for further research addressing goal ambiguity in different national and organizational contexts, and considering how these different circumstances affect ambiguity.

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Table 1: Number of papers selected based on type of journal

Type of journal in the ABS Guide 2018	Distribution of articles	
	Journal	Number of articles
Public Sector	Journal of Public Administration Research and Theory	9
	The American Review of Public Administration	3
	International Journal of Public Administration	2
	International Public Management Journal	2
	Administration and Society	1
	Health Care Management Review	1
	Public Administration	1
	Public Administration Review	1
	Public Money and Management	1
	Public Performance & Management Review	1
Accounting	Financial Accountability & Management	2
	British Accounting Review	1
	European Accounting Review	1
	Management Accounting Research	1
	Qualitative Research in Accounting & Management	1
Human resource management	Asia Pacific Journal of Human Resources	1
	Employee Relations	1
	International Journal of Manpower	1
	Public Personnel Management	1
	Review of Public Personnel Administration	1
Organisation studies	Qualitative Research in Organizations and Management	1
Strategy	Journal of Change Management	1
Total		35

Table 2: Ambiguity perspectives in the literature, and their references

Ambiguity perspective		Number of articles	References
Objective ambiguity perspective	Policy implementation	3	Matland, 1995; Arnaboldi and Lapsley, 2009; Arnaboldi and Palermo, 2011
	Performance measurement systems implementation	5	Lawton, 2000; Modell, 2004; Vakkuri and Meklin, 2006; Vakkuri, 2010; Pilonato and Monfardini, 2020
	Organizational goal ambiguity	18	Baldwin, 1987; Wright, 2004; Chun and Rainey, 2005a; 2005b; Pandey and Rainey, 2006; Pandey and Wright,

			2006; Lee et al., 2010; Calciolari et al., 2011; Jung, 2011; Jung and Rainey, 2011; Stazyk et al., 2011; Stazyk and Goerdel, 2011; Jung, 2012a; 2012b; 2014a; 2014b; Sun et al., 2014; Rainey and Jung, 2015
Subjective ambiguity perspective	Mission comprehension ambiguity	3	Chun and Rainey, 2005a; 2005b; Jung, 2014b
	Role ambiguity	11	Pandey and Wright, 2006; Addae et al., 2008; Reid et al., 2008; Baraldi et al., 2010; Stazyk et al., 2011; Brunetto et al., 2011; 2012; Jung, 2014b; Pakarinen and Virtanen; 2016; Skrinou and Gkorezis, 2019; Oppi and Vagnoni, 2020
	Tolerance of ambiguity	2	Pandey and Wright, 2006; Tsirikas et al., 2012

Table 3: Antecedents and consequences of ambiguity variables

Ambiguity perspective	Variables	Antecedents	Consequences	References
Objective ambiguity perspective	1. Goal clarity	↓ centralization of decision making (for lower managers and employees) ↓ external control ↑ political support ↑ internal communication ↑ formalization (rule specification) ↑ task specialization ↑ person-job fit ↓ role ambiguity	↑ performance (mediated by hierarchical authority) ↑ work motivation ↓ role ambiguity	Baldwin, 1987; Wright, 2004; Pandey and Rainey, 2006; Calciolari et al., 2011; Stazyk and Goerdel, 2011; Stazyk et al., 2011; Sun et al., 2014
	2. Directive goal ambiguity	↑ financial "publicness" ↑ regulatory policy responsibility ↑ policy problem complexity ↑ statutory mandates ↓ routineness ↓ organizational age	↓ performance ↓ managerial effectiveness ↓ customer service orientation ↓ productivity ↓ work quality	Chun and Rainey 2005a; 2005b; Lee et al. 2010; Rainey and Jung, 2015
	3. Priority goal ambiguity	↑ political salience ↑ organizational complexity ↑ financial "publicness" ↑ number of stakeholders ↑ organizational age ↑ number of goals ↓ regulatory policy responsibility ↓ measurability of goals	↓ managerial effectiveness ↓ job satisfaction	Chun e Rainey, 2005a; 2005b; Jung, 2014b; Lee et al., 2010; Calciolari et al., 2011; Rainey and Jung, 2015
	4. Evaluative goal ambiguity	↑ organizational complexity ↑ financial "publicness" ↑ political salience ↑ regulatory policy responsibility	↑ turnover intentions ↓ performance ↓ managerial effectiveness ↓ customer service orientation ↓ productivity	Chun e Rainey, 2005a; 2005b; Lee et al., 2010; Jung and Rainey, 2011; Jung, 2012a; 2012b; 2014a,

		Antecedents	Consequences	Sources
		↑ hybrid policy responsibilities ↑ policy problem complexity ↓ routineness ↓ managerial capabilities	↓ work quality ↓ work motivation	Rainey and Jung, 2015
	5. Target-specification goal ambiguity	↓ concreteness of objectives ↓ quantification of objectives	↑ focus on outomes ↑ turnover intentions ↓ performance ↓ job satisfaction ↓ goal specificity	Jung and Rainey, 2011; Jung, 2011; 2012a; 2012b; 2014a; 2014b;
	6. Time-specification goal ambiguity	↓ short-term objectives	↑ turnover intentions ↓ performance ↓ work motivation ↓ job satisfaction ↓ goal specificity	Jung, 2011; 2012a; 2012b; 2014a 2014b; Jung and Rainey, 2011
	7. Goal conflict		↓ work motivation (mediated by organizational goal specificity and procedural constraints) ↓ perceived realism ↓ perceived feasibility	Wright, 2004; Calciolari et al., 2011
	8. Number of goals		↓ performance	Jung, 2011
Subjective ambiguity perspective	1. Mission comprehension	↑ evaluative ambiguity ↑ priority ambiguity	↓ job satisfaction ↓ productivity ↑ managerial effectiveness ↑ customer service orientation	Chun and Rainey, 2005a; 2005b; Jung, 2014b
	2. Role ambiguity	↑ ambiguity of managerial reforms ↑ centralization of managerial functions ↑ bureaucratization ↑ conflicting lines of authority ↑ conflicts of authorities ↑ imbalance of responsibilities ↑ ambiguities in job description ↑ scarce quality of the communication between manager and employees and among employees ↓ role specification ↓ task prioritisation ↓ clear work distribution ↓ tolerance for ambiguity ↓ goal clarity	↓ organizational commitment (affective and normative commitment in particular) ↓ job satisfaction ↑ turnover intentions ↓ job performance ↓ psychological empowerment of employees ↑ the lost sense of control over the work ↓ perceived quality of work ↓ perceived productivity ↓ customer satisfaction ↑ frustration ↓ goal clarity	Pandey and Wright, 2006; Addae et al., 2008; Reid et al., 2008; Baraldi et al., 2010; Brunetto et al., 2011; 2012; Jung, 2014b; Sun et al., 2014; Pakarinen and Virtanen, 2016; Skrinou and Gkorezis; 2019; Oppi and Vagnoni, 2020
	3. Tolerance of ambiguity	↑ knowledge of management tools ↑ organizational learning	↑ productivity ↓ role ambiguity	Pandey and Wright, 2006; Tsirikas et al., 2012

Table 4: Operationalization of ambiguity variables

Ambiguity perspective	*Variables*	*Operationalization in literature*
Objective ambiguity perspective	1. Goal clarity	- Stazyk and Goerdel (2011, p. 668) and Stazyk et al. (2011, p. 614) on a ten-point scale: 1. The organization's mission is clear to almost everyone who works here (reversely coded). 2. It is easy to explain the goals of this organization to outsiders (reversely coded). 3. The organization has clearly defined goals (reversely coded). - Wright (2004, p. 75) with reference to organizational goal specificity on a five-point scale: 1. I can clearly explain the direction (vision, values, mission) of this organization to others. 2. This organization has specific and well defined objectives. 3. There is a clear understanding of organizational priorities. - Pandey and Rainey (2006, p. 109-110) on a ten-point scale: 1. This organization's mission is clear to almost everyone who works here (reversely coded). 2. It is easy to explain the goals of this organization to outsiders (reversely coded). 3. This organization has clearly defined goals (reversely coded).
	2. Directive goal ambiguity	- Ratio of the number of pages of administrative rules to the number of pages of legislation (Chun and Rainey, 2005a, p. 5; 2005b; Lee et al., 2010; Rainey and Jung, 2015). - The extent to which organizational mission is translated into concrete activities and behaviours (Rainey and Jung, 2015).
	3. Priority goal ambiguity	- Average Z-scores, a combined measure of two indicators: the number of long-term strategic goals and the number of annual performance targets (Chun and Rainey, 2005a; 2005b; Lee et al., 2010; Jung and Rainey, 2011).
	4. Evaluative goal ambiguity	- Percentage of subjective or workload-oriented performance indicators from the total of performance indicators (Chun and Rainey, 2005a, p. 5; 2005b; Lee et al., 2010; Jung, 2014a; Rainey and Jung, 2015). - Program evaluation goal ambiguity is measured by the percentage of output and output-oriented efficiency measures (opposed to outcome and outcome-oriented efficiency measures) among all performance indicators for each federal program (Jung, 2012a; Jung, 2014a).
	5. Target-specification goal ambiguity	- The proportion of program performance objectives without concrete targets to the total number of program performance objectives (Jung, 2011, p. 199; 2012a; 2012b; 2014a; 2014b; Jung and Rainey, 2011).
	6. Time-specification goal ambiguity	- The proportion of performance objectives with unclear distinction between annual and long-term timelines to the total number of performance objectives in all the programs (Jung, 2012b, p. 218; 2012a; 2014a; 2014b; Jung and Rainey, 2011). - The proportion of duplicate performance objectives to the total number of performance objectives in all the programs (Jung, 2011, p. 200; Jung and Rainey, 2011).
	7. Goal conflict	- Wright (2004, p. 75) on a five-point scale: 1. To satisfy some people, this organization will inevitably upset others. 2. This organization has been given conflicting priorities. 3. This organization seems to be working at cross-purposes. 4. Success in some parts of this organization undercuts the success of others.
	8. Number of goals	- Number of goals set (Jung, 2011).
Subjective ambiguity perspective	1. Mission comprehension	- Jung (2014b, p. 975) on a five-point scale: 1. I understand my agency's mission (reversely coded). 2. I understand how I contribute to my agency's mission (reversely coded). - Gunning-Fog Index (GFI) of an agency's mission statement: the average sentence length of the mission statement + the percentage of hard words in the statement (Chun and Rainey, 2005a, p. 5; 2005b)
	2. Role ambiguity	- Pandey and Wright (2006, p. 526) from Rizzo et al. (1970) on a five-point scale: 1. My job has clear, planned goals and objectives (reversely coded). 2. I feel certain about how much authority I have (reversely coded).

			3. I know exactly what is expected of me (reversely coded).

<table>
<tr><td></td><td></td><td>-</td><td>Brunetto et al. (2011, p. 526) from Johlke and Duhan (2000) on a six-point scale:
1. I am certain of which specific nursing strengths I should present to my patients (reversely coded).
2. In my job, I am certain of how much service I should provide to my patients (reversely coded).
3. I am certain of what I am expected to do for my patients (reversely coded).</td></tr>
</table>

		-	Skirnou and Gkorezis (2019, p. 5) (2011, p. 526) three items (not reported explicitly) from the following six-item scale by Rizzo et al. (1970) on a five-point scale. The same items were adopted by Addae et al. (2008) on a seven-point scale: 1. I have clear, planned goals and objectives for my job. 2. I know that I have divided my time properly. 3. I know what my responsibilities are. 4. I know exactly what is expected of me. 5. I feel certain about how much authority I have on the job. 6. Explanation of what has to be do done is clear.
		-	Unclear where the decisions are made, uneven distribution of work and difficulties in prioritizing one's own work between job-related tasks (Pakarinen and Virtanen, 2016)
	3. Tolerance of ambiguity	-	Tsirikas et al. (2012) from Budner (1962, p. 34) on a seven-point scale: 1. An expert who doesn't come up with a definite answer probably doesn't know very much. 2. Decided to live in a foreign country for a while. 3. There is really no such thing as a problem that can't be solved. 4. People who fit their lives to a schedule probably miss much of the joy of living. 5. A good job is one where what has to be done and how it has to be done are always clear. 6. It is more fun to tackle a complicated problem than to solve a simple one. 7. In the long run, it is possible to get more done by tackling small, simple problems rather than large, complicated ones. 8. Often the most interesting and stimulating people are those who don't mind being different and original. 9. What we are used to is always preferable to what is unfamiliar. 10. People who insist on a yes or no answer just don't know how complicated things really are. 11. A person who leads an even, regular life in which only a few surprises or unexpected events arise really has a lot to be grateful for. 12. Many of our most important decisions are based on insufficient information. 13. I like parties where I know most of the people more than ones where all or most of the people are complete strangers. 14. Teachers who hand out vague assignments given one a chance to show initiative and originality. 15. The sooner we all acquire similar values and ideals the better. 16. A good teacher is one who makes you wonder about your way of looking at things.