



Review

A comprehensive framework for the activation, management, and evaluation of Co-production in the public sector

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ABSTRACT

Co-production analyses the practices in which state or firms and lay actors work together in any phase of the production cycle. In the public sector, citizens are not seen as mere recipients of services but as co-producers at different stages. Scholarly interest in co-production has grown steadily in the past years. However, the research has yet to integrate the many co-production concepts into a distinctive theoretical comprehensive framework able to strengthen the understanding of the interrelated dynamics at play. The article conducts a systematic in-depth qualitative review of the co-production literature for the public sector. The results highlight the main components into four pillars of a comprehensive theoretical framework to guide scholars and practitioners in the activation and management of co-production as well as in the evaluation of its outcomes. The article concludes by formulating a future research agenda for co-production in the public sector.

Authors' statement

Authors are listed in alphabetical order; they all have made substantial contributions to conception and design, acquisition of data, and analysis and they have equally been involved in drafting and revising the manuscript.

1. Introduction

While being a longstanding topic of research in the private sector literature (Oertzen et al., 2018; Vargo and Lusch, 2004), co-production in the public sector has gained a global resurgence of interest in the past decade. The involvement of citizens in the decision-making process and the delivery of public services has blossomed into a vibrant field of study (Brandesen et al., 2018). Indeed, the effectiveness of public policies, governance and legislation, including those aimed at cleaner production, environmental, and sustainability, increasingly depends on the behaviors and contribution of citizens and the community so that a cross-cut framework based on findings coming from different contexts and fields may provide useful insight also for context-specific policies. In the framework of cleaner production, the coproduction of public

services plays a relevant role hand in hand with other innovations in the prevention of the production of waste and in the efficient use of energy, water, resources, and human capital.

Since its first definition by Elinor Ostrom in the 1970s, co-production has been used with a large variety of meanings and it is a "rather heterogeneous umbrella concept" (Verschuere et al., 2012). However, recently several efforts have been made to clarify the co-production concept (Brandesen and Honingh, 2016; Nabatchi et al., 2017; Osborne et al., 2016). In general, there is some agreement that it covers the practices in which state actors (i.e. government agents serving in a professional capacity) and lay actors (i.e. members of the public, serving voluntarily as citizens or users) work together in any phase of the public service cycle (i.e. commissioning, design, delivery, and assessment) (Nabatchi et al., 2017).

Thus, co-production implies that citizens are not merely recipients of services but can act as co-producers at different stages of the production process of public services.

The rapid growth of studies has already spawned a number of literature reviews on co-production. Indeed, several works have tried to offer a synthesis of co-production in the public sector in general (Sicilia et al., 2019; Verschuere et al., 2012; Voorberg et al., 2015) and in specific

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contexts (Honigh et al., 2018; Palumbo, 2016; Loeffler and Bovaird, 2016).

Despite this number of summaries, scholars keep calling for a better understanding of co-production into a comprehensive framework that integrates the wide array of concepts, dimensions, and their relationships (Brandson et al., 2018; Dudau et al., 2019).

While academic research has paid a great deal of attention to the most influential factors in activating co-production (Voorberg et al., 2015; Sicilia et al., 2019) such as citizen characteristics, customer awareness of being part of something; risk aversion; the presence of incentives; public compatibility with citizen participation and presence of social capital, a clear and separate classification of the exogenous factors and characteristics of the environment in which co-production takes place is still missing (Sicilia et al., 2019).

Likewise, so far studies have largely discussed the expected effects of co-production, but their systematization is lacking. In this respect, it is worth noticing that previous reviews have already pointed out the paucity of empirical research aimed at understanding the ultimate effects of co-production, and their empirical evaluation (Sicilia et al., 2019; Verschuere et al., 2012; Voorberg et al., 2015). This may be mainly ascribed to the celebratory nature of co-production, and the normative assumption behind its “magic nature”, that the outcomes of (public) services in which users and professionals work together actively ought to be “better services” (Dudau et al., 2019; Voorberg et al., 2015). This lack of systematic knowledge represents a stage of enchantment with the co-paradigm and, at the same time, an impetus for disenchantment (Dudau et al., 2019: 1582; Jo and Nabatchi, 2016).

Finally, the recent interest in the high complexity and failure rate of co-production, which may lead to value co-destruction (Järvi et al., 2018; Williams et al., 2016), has paved the way to widespread agreement that the design and implementation of co-production initiatives affect the quality of collaboration and its outcomes (Aschhoff and Vogel, 2018; Cepiku, 2017; Mustak et al., 2016). So far, reviews have not provided a comprehensive analysis of ways in which co-production is managed.

This paper aims to fill this gap by developing a distinctive theoretical comprehensive framework for co-production which benefits also on the extant knowledge on cross-sector collaboration in the public sector (Bryson et al., 2015; Emerson et al., 2011) and the insights coming from private sector literature where co-production has been extensively researched, especially empirically (Agarwal, 2013), that previous literature reviews have overlooked.

Taking into due account context specificities, private sector studies were systematically and qualitatively reviewed with those of the co-production literature in the public sector to: i) summarize the state of knowledge on co-production, identifying the key variables for its activation, management, and evaluation and the interrelated dynamics at play; ii) discuss managerial strategies and tools that are effective in the launch, implementation, and evaluation of co-production initiatives in specific contexts and conditions and; iii) identify areas which lack investigation or need closer examination.

Hence, the theoretical comprehensive framework proposed in this article contributes to filling the gaps previously identified in several regards. Firstly, it provides a novel classification of the different variables affecting the activation of co-production. Secondly, the framework offers a classification of the different levels and types of outcomes of co-production. These classifications can inform future studies and allow a consistent accumulation of knowledge concerning co-production activation and evaluation. Thirdly, this framework introduces the concept of co-production management and implementation, highlighting the main managerial levers of co-production investigated in the literature, from both a theoretical and practical perspective. Finally, the framework benefits also of findings from the private sector literature when they are appropriate or suitable for public services as well.

The article is structured as follows. In the next section, the research aim, and methodological approach are detailed. The results are

classified into the proposed comprehensive framework under the four key headings of context, antecedents, management, and outcomes of co-production. The article then discusses the strategies and tools available to public managers to support the co-production decision-making process, manage the stakeholders and dynamics at play, and achieve the desired outcomes. The article concludes by suggesting a trajectory for future research.

2. Material and methods

The article is based on a systematic approach to the review of the literature. It differs from traditional narrative reviews by relying on a replicable, scientific, and transparent process for the selection of articles (Tranfield et al., 2003). A three-step procedure was applied for the search, selection, and review of the co-production extant literature. Fig. 1 illustrates the three steps through the PRISMA (the Preferred Reporting Items for Systematic reviews and Meta-Analyses) flow chart (Moher et al., 2009) while Appendix 1 reports the PRISMA Checklist.

The first step was aimed at identifying existing studies on co-production conducted either in the public or private sector. Papers relating to the latter were included considering that co-production has been extensively researched in the business sector (Agarwal, 2013). Taking into due account context specificities, these provided some insights into developing our comprehensive framework and identifying areas in need of further research in the public sector.

An electronic keyword search for titles, abstracts and/or keywords containing the terms “co-production” or “coproduction” was conducted in June 2019 across ISI Web of Knowledge and Scopus. These two databases were chosen as they represent broad and comprehensive databases in social sciences research, covering the main journals dealing with co-production. We then checked the quality of the data extracted from these two databases through pilot analyses related to cross-reference with previous reviews on specific domains of co-production and additional *ad hoc* consultations on another database (EBSCO). The quality check provided positive feedback on the opportunity to keep these two databases. The search was limited to peer-reviewed English-language articles and to the subject areas of social science such as management, business, public administration, economics, or sociology (the full electronic search strategy was reported in appendix 2). This step returned 2359 articles, excluding the duplicates.

The second step was to conduct a qualitative screening of the titles and abstracts to identify those that met the following eligibility criteria: original articles on the co-production of services or products either conceptually discussing or reporting empirical evidence on the components that may influence activation, management, and evaluation of the co-production. A pilot screening of the first 800 articles was executed first independently and then together by two couples of authors to align the assessment strategy. Then the first-round screening of titles and abstracts and the second round of full-text screening were carried out. Both first- and second-round screening was independently conducted by two authors; discrepancies over the eligibility were solved by the discussion between the couple or, when necessary, with the other two authors. In the screening stages, articles on knowledge co-production, political participation, or co-production not involving final users were excluded. This step returned 348 articles.

The third step was the in-depth qualitative analysis of the 348 articles. The final selection, coming from the full-text reading of the articles, returned a total of 266 articles.

Once the selection stage was completed, the findings were classified using two complementary approaches: i) a deductive approach to define the macro dimensions or pillars of the framework and ii) an inductive approach to identify the components that characterize each pillar.

First, articles were classified according to the theme to which they prevalently contributed. To this end, the pillars commonly defined in general collaborative governance frameworks were used. This choice is motivated by the acknowledgment that co-production is a form of

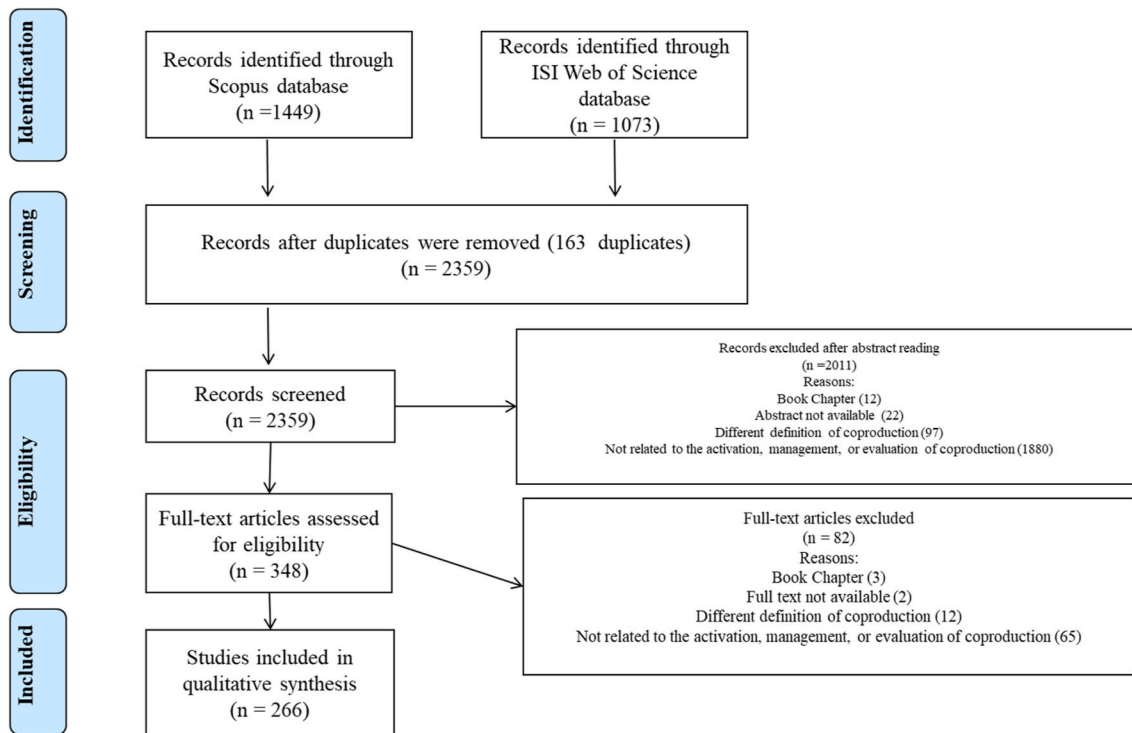


Fig. 1. The literature review PRISMA flow diagram.

collaborative governance in that it involves the engagement of people across the boundaries (Emerson and Nabatchi, 2015), more specifically people of public agencies and the civic sphere. Thus, the pillars of the framework identified according to the collaborative governance literature are: i) general context that analyses the opportunities and the constraints of environmental variables which influence how the collaborative governance initiative unfolds; ii) antecedents, that is a set of initial conditions and drivers, separate from system context that can be either conducive or unfavorable to the implementation of collaborative arrangements; iii) collaborative management (processes and structures) that promotes cross-sector collaboration as well as reaches agreement on collaborative goals and actions iv) outcomes of collaboration that includes the analysis of the variables influencing the final results of co-production.

Then, an inductive approach was adopted to identify the analytical components of each pillar and to investigate their relationships. In particular, the collaboration management literature, much inspired by the network management literature, emphasizes procedural and institutional arrangements, often neglecting actor-related actions such as the management (motivation, training, socialization) of lay actors and professionals and the effects of intensity, size, and scope of co-production on their motivation. Collaborative governance frameworks focus on collaborative arrangements between organizations across sectors and civil society, typically not involving lay actors (Sancino and Jacklin-Jarvis, 2016) that are one of the key actors in co-production. The consequences of such a different scope on inter-organizational configurations rather than inter-personal relations, at the heart of co-production, manifest in the difference in terms of the variables investigated by the two fields. To identify the analytical components of the four pillars of the framework, two scholars codified each article. The entire research team discussed and resolved disagreements. Moreover, the whole research team discussed the labels adopted to classify the components of the four pillars. The complete list of the data extraction form was reported in appendix 2.

3. Preliminary information on the literature review

In this section, some basic information about the articles included in the review is provided. As shown in Fig. 2, interest in the management and evaluation of co-production was low till early 2000: 92% of the selected articles were published in the past decade (2008- mid-2019) with exponential growth in the past five years (2013–2018) (Fig. 2).

Table 1 reports the most recurring publication outlets. Around half of the selected articles were published in public administration and policy journals, demonstrating the renewed interest of public-sector scholars in co-production.

Approximately one-third appeared in general management journals, including marketing journals, while around 20% were in specialized journals. This confirms that co-production is relevant to several streams of research and disciplines.

From a methodological viewpoint, the large majority of papers are empirical (Table 2), with the public-sector co-production articles being predominantly qualitative and private-sector articles being mainly based on quantitative analyses (mostly related to experimental design).

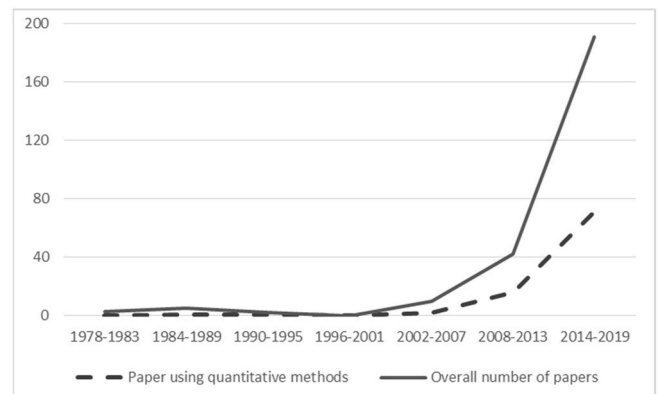


Fig. 2. Number of publications on Co-production by year (1978–2019).

Table 1
Most recurring journals.

Journals	#
General management journals	71
Journal of Service Research	5
Journal of Marketing	4
Journal of Retailing and Consumer Services	3
Journal of Service Management	3
Journal of the Academy of Marketing Science	3
British Journal of Management	2
Journal of consumer behaviour	2
Journal of Service Theory and Practice	2
Management Decision	2
Marketing Letters	2
Service Industries Journal	2
Other general management journals	41
Public administration and policy journals	137
Public Management Review	31
Voluntas	10
Public Administration Review	9
International Journal of Public Administration	7
American Review of Public Administration	6
International Journal of Public Sector Management	6
International Review of Administrative Sciences	6
International Public Management Journal	4
Policy and Society	4
Public Administration	4
Public Money & Management	4
Administration & Society	3
Journal of Public Administration and Theory	3
Journal of Social Policy	3
Social Policy and Society	3
Australian Journal of Public Administration	2
Policy Studies Journal	2
Public Policy and Administration	2
Social Policy & Administration	2
Other public administration and policy journals	26
Sectoral journals	59
Urban Affairs Review	3
Children and Society	2
Environment and Urbanization	2
Journal of Mental Health Training, Education and Practice	2
Other sectoral journals	49

Table 2
Methodology applied in the papers collected.

Methodology	Private sector	%	Public sector	%	Total	%
Qualitative	26	39%	147	74%	173	65%
Case study	4	6%	41	21%	45	17%
Conceptual	6	9%	23	12%	29	11%
Literature review	5	8%	13	7%	18	7%
Other techniques	11	17%	70	35%	81	30%
		0%		0%		0%
Quantitative	37	56%	44	22%	81	30%
Experimental	16	24%	10	5%	26	10%
Other techniques	21	32%	34	17%	55	21%
		0%		0%		0%
Mixed	3	5%	9	5%	12	5%
Total	66	100%	200	100%	266	100%

Overall, the past five years have seen an increase in the use of quantitative methods, in particular, experimental design studies increased both in private and public-sector articles.

In terms of service areas, public-sector articles tend to primarily focus on healthcare, neighbourhood and environmental services, followed by child care, education and others. Most of the public-sector articles investigated co-production in Europe and North America,

while the majority of private-sector studies originated in Asian countries.

4. Results

The review of the relevant literature has led to the identification of the analytical components of each key dimension of co-production: general context, antecedents, management, and outcomes of co-production. These insights are consolidated into a comprehensive framework (Fig. 3) that can advance understanding of how the process unfolds from a holistic perspective and the underexplored interrelation dynamics at play.

The Appendix reports the full list of the articles analyzed. In the following sections, only selected references are quoted.

4.1. General context

The general context helps to view co-production as a system embedded in, and interacting with, a larger environment. It includes characteristics of the environment in which practices of co-production take place and include several elements, such as availability of resources, state and governance traditions, regulatory frameworks, and socio-economic and cultural issues (Jo and Nabatchi, 2016). Research has shown that the adoption of co-production is promoted by the resource availability which can be referred to: financial resources (Munoz et al., 2014), social capital (Andrews and Brewer, 2013), and the existence of basic public service infrastructure (Chaebo and Medeiros, 2017). With specific reference to the state and administrative traditions, the initiation of co-production seems to be hampered in the administrative context with rigid rules and regulations (Sudhipongpracha and Wongpredee, 2016; Voorberg et al., 2018). However, an authoritative state tradition may facilitate the implementation of co-production, whereas a consultative state tradition means many actors are responsible for different parts of public service delivery and changes in the service cycle are slower (Voorberg et al., 2018). However, in countries in which the state plays a less central role, there is more room for the involvement of citizens in public service provision (Parrado et al., 2013).

The regulatory framework may serve a central role in the promotion and dissemination of co-production (Chaebo and Medeiros, 2017): the law specifies the rules for the transfer of responsibilities from the public organizations and, at the same time, allows to counter discriminations that may be triggered by some co-production initiatives.

Finally, the nature of welfare reforms (Pestoff, 2009; Rantamaki, 2017) can affect co-production: welfare reform that emphasizes economically rational individuals who maximize their utilities tends to play down values of reciprocity and solidarity and thus co-production (Pestoff, 2009). On the contrary, when people are worried about the future of public welfare services new participatory approaches are more likely to manifest (Rantamaki, 2017).

The characteristics of the general context can positively or negatively influence a co-production initiative, how it unfolds and its outcomes, not only at the moment in which co-production is launched but also at different moments along the way.

4.2. Antecedents

In addition to the general context, several articles have identified more direct factors that can be either conducive or unfavorable to the implementation of co-production. In this article, these factors are called “antecedents” and are categorized into three groups: antecedents related to the lay actors, to the regular provider, and to the nature of the service being coproduced. Some factors are exogenous forces, while others can be effectively addressed to initiate co-production, improve interactions and shape the outcomes.

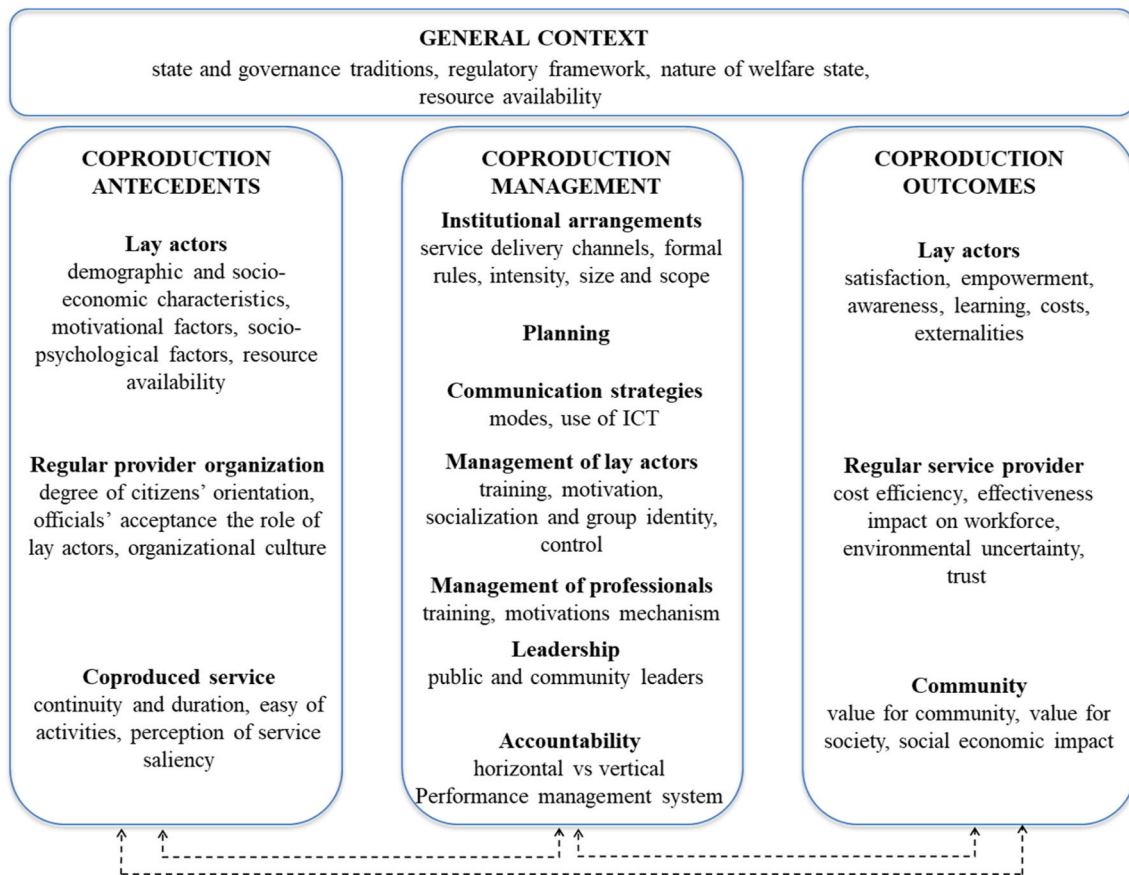


Fig. 3. A comprehensive framework for the activation, management, and evaluation of co-production.

4.2.1. The lay actors

Existing literature has identified several factors related to lay actors that can affect the occurrence of co-production. These factors can be classified into the following categories: demographic and socio-economic characteristics, motivational factors, socio-psychological characteristics, and resource availability. For each category, the main findings of previous research are briefly presented.

4.2.1.1. Demographic and socio-economic characteristics. Many studies have investigated the relationship between the propensity to co-produce and demographic and socio-economic characteristics of the lay actors, including gender (e.g., Alonso et al., 2019; Bovaird et al., 2015; Uzochukwu and Thomas, 2018), age (Alford and Yates, 2016; Uzochukwu and Thomas, 2018), education (Parrado et al. 2013; Bovaird et al., 2015; Alonso et al., 2019; Uzochukwu and Thomas, 2018), employment status (Alford and Yates, 2016), income (Jakobsen and Andersen, 2013; Jakobsen and Andersen, 2013; Uzochukwu and Thomas, 2018), as well as the relationship that lay actors have with others (citizens or with service-provider organizations) (Van Eijk and Steen, 2016). However, results so far are inconclusive, with studies reporting not consistently significant associations between the above-mentioned factors and the propensity to adopt coproductive behaviors (Van Eijk and Steen, 2016).

4.2.1.2. Motivational factors. Drawing on psychological and organizational literature, studies on co-production have analyzed extrinsic, intrinsic, and prosocial motivations. As to extrinsic motivations, material rewards, such as money, goods, or services are seen as effective “for client co-production only when the work is easy to prescribe and verify” (Alford, 2009) and when private value is consumed (Alford, 2002, 2009). A recent study by Voorberg et al. (2018) has shown that financial rewards are not particularly effective in encouraging co-production.

Other extrinsic motivations, such as solidarity needs (i.e. socializing and conviviality) and normative commitment (identification with valued social and moral ideals or principles) are proposed as drivers for involvement (Alford, 2002; Parrado et al., 2013; Van Eijk and Steen, 2014). Intrinsic motivation, qualified as an example of non-material (Alford, 2002) and self-centered motivation for lay actors’ engagement, seems to represent a required aspect for co-production (Fledderus and Honing, 2016). Finally, studies have highlighted the importance of prosocial motivation in affecting the willingness to coproduce (van Eijk and Steen, 2014; van Eijk et al., 2017).

4.2.1.3. Socio-psychological factors. The extant literature on co-production has focused on trust and self-efficacy. Trust in the regular provider of services has been identified as a precondition for involvement (Hsu et al., 2012; Parrado et al., 2013; Fledderus et al., 2015; Fledderus and Honing, 2016; Li and Hsu, 2017). However, Fledderus et al. (2014) highlight that for triggering co-production also trust in other people (called “interpersonal” or “social” trust) is important. Self-efficacy is another social psychological characteristic that has been investigated in the co-production literature to explain variation in the co-production level of lay actors. Two main typologies of self-efficacy are conceptualized in literature: political self-efficacy, which refers to the extent to which a person thinks that ordinary citizens or people can make a difference (e.g., Parrado et al., 2013; Bovaird et al., 2015), and individual self-efficacy, which is “people’s beliefs in their capabilities to produce given attainments” (Bandura, 2006). Both types of self-efficacy are associated with co-production: studies have shown that lay actors with lower perceptions of political (Parrado et al., 2013; Bovaird et al., 2015, 2016; Alford and Yates, 2016) and individual (Fledderus and Honing, 2016; Thomsen, 2017; Alonso et al., 2019) self-efficacy are less likely to act as coproducers.

The lay actors' propensity to co-produce hinges on whether they have the *resource availability* in terms of time (Hunt et al., 2012; Jakobsen and Andersen, 2013; Morton and Paice 2016; Kaehne et al., 2018, Nance and Ortolano's (2007), knowledge and basic tools (Folz, 1991; Jakobsen and Andersen, 2013; Jakobsen and Andersen, 2013; Thomsen, 2017). In the presence of incongruence between the goals of the lay actors and those of the regular provider, the asymmetry with respect to lay actors' skills and expertise may lead to opportunistic behavior (Ertimur and Venkatesh, 2010).

4.2.2. The regular provider organization

Several characteristics of the regular provider organization may influence its orientation toward activation of co-production. The attitudes of politicians and professionals are crucial to co-production (Voorberg et al., 2015). In this respect, Cassia and Magno (2009) show that the *degree of citizen orientation* of politicians is a driver of the implementation of co-production. Other studies point to the importance of the *acceptance of the lay actor* as a partner by professionals (Bovaird, 2007; Sicilia et al., 2016). Professionals often find it difficult to accept an active role of lay actors, as they are not prone to share their power and control with lay actors and to modify their traditional *modus operandi* (Verschuere et al., 2012; Osborne and Strokosch, 2013; Kershaw et al., 2018). Another characteristic of the regular provider that impinges on co-production is its *organizational culture*, whereby a culture adverse to innovation, flexibility, and risk-taking can be a barrier (Voorberg et al., 2015).

4.2.3. The co-produced service

Another set of antecedents is related to the specific characteristics of the co-produced service. Services characterized by the *continuity and the duration* of specific needs, with lay actors locked in for several years, are more suitable for co-production (Bovaird and Loeffler, 2012; Pestoff, 2012, 2014). Under these circumstances, co-production is a potential way for lay actors to influence the development of the service, especially when the provider cannot be easily switched (Pestoff, 2012).

Different services require lay actors to perform different types of activities. When tasks can be *easily performed*, lay actors are more willing to coproduce. Highly professionalized services with a high level of specialization seem to be less conducive to co-production (Parrado et al., 2013), as opposed to when the required relevant actions are relatively easy (Pestoff, 2012; Bovaird et al., 2015; Vanleene et al., 2017). This should also be accompanied by ease of involvement (Bovaird et al., 2015; Pestoff, 2012; Vanleene et al., 2017). However, Neghina et al. (2017) have shown that the nature of services (professional versus generic services) only affects the motives that stimulate willingness to co-produce. In particular, users are motivated by empowering motives (i.e. connected to the desire to negotiate the power to influence the service process or outcome) within professional services, whereas individualizing and relating motives are predominant in generic services.

Research also suggests that co-production is more likely when lay actors perceive the service as salient (Pestoff, 2012; Van Eijk and Steen, 2016; Chaebo and Medeiros, 2017). *Service salience* is the importance attached to a service depending on the individual's perception of the ability of a service to generate personal or/and public benefits (Pestoff, 2012; Alford, 2002). In general, services that show a high level of private value are co-produced the most often (Alford and Yates, 2016).

4.3. Co-production management

High complexity and value tensions in co-production may lead to a high failure rate of initiatives and value co-destruction. The management of the co-production initiative acquires particular relevance because of its ability to address the challenges of collaboration between the regular provider and the lay actors, directly impacting the sustainability and quality of interaction and indirectly impacting the outcomes for the co-producers, the service, and the community as a whole.

Six co-production management levers were identified from the

literature review: institutional arrangements; communication strategies; management of lay actors; management of professionals, leadership, and accountability.

4.3.1. Institutional arrangements

This component includes the design and structure of service delivery channels, the formal rules governing the interaction between lay actors and regular providers, especially their professional staff, and the intensity, size, and scope of the co-production.

4.3.1.1. Service delivery channels. In terms of service delivery channels, Flores and Vasquez-Parraga (2015) inform that offering co-production as an option rather than as the only means of service rendering has a stronger positive impact on relational and economic value creation.

Co-production formal rules include eligibility criteria (selection of actors), the definition of boundaries (selection of activities), and allocation of responsibilities (Brandesen and Helderman, 2012). When designing co-production structures and processes, providers should verify if the citizens with the greatest need for the service, excluded or oppressed groups, are also affected (Jakobsen and Andersen, 2013). Especially when there are low levels of trust, co-production is more likely to succeed when the rules allow immediate sanction for failures of reciprocity, or when a third party enforces co-producing parties' commitments (Lierl, 2016; Workman, 2011).

Finally, *co-production intensity, size, and scope* are important aspects of co-production management. The role of co-production intensity (defined as lay actors' subjective perception of the extent of effort and time invested within a specific process of co-producing a product or service) has largely been neglected in the public sector. The private-sector literature agrees that undesired effects manifest beyond a certain level of co-production intensity, for instance, higher intensity of co-production may reduce the level of customer's self-efficacy and loyalty (Stokburger-Sauer et al., 2016) as well as of customers' satisfaction with the co-production process (Haumann et al., 2015). Firms can mitigate these negative effects by employing a communication strategy and by offering immediate support when customers experience difficulties within the co-production process. Users respond differently to higher assigned co-production workloads as a function of both individual differences and the conditions under which the workload is encountered (Mende et al., 2017). Yet, these findings should be tested in the public sector also investigating the patterns of intensity related to time and efforts for lay actors in co-producing public services.

4.3.2. Planning

Planning allows regular producers and lay actors to come to a shared understanding of the focus and purpose of coproduction activities and to avoid being directed toward divergent or even conflicting ends (Frieling et al., 2014). However, rational approaches to planning seem to clash with the absence of hierarchy that characterizes voluntary collaborations. Further research is needed on the characteristics of co-production, and the role of planning.

4.3.3. Communication strategies

One of the most frequently investigated co-production management strategies is the effectiveness of communication to generate a common consensus about what two parties can do with and for each other (Owens and Cribb, 2012; Hsieh and Hsieh, 2015; Shandas and Messer, 2008; Parrado et al., 2013; Sorrentino et al., 2017). Two sub-components can be identified: modes and the use of information communication technology (ICT).

4.3.3.1. Modes. For example, face-to-face communication helps establish a clear purpose (Essén et al., 2016). Communication strategies that either emphasize specific co-production value propositions or highlight additional co-production service supplements can mitigate the negative

effects of co-production intensity on customer satisfaction with the co-production process (Haumann et al., 2015). Owens and Cribb (2012) identify unresolved epistemic differences across professional and lay actors that may threaten a co-productive service. Spanjol et al. (2015) also suggest that communication is not sufficient and should not aim at improving adherence per se, but rather at helping lay actors discover the characteristics of their environment and existing behavioral patterns that impinge on adherence to provider instructions. Thomsen and Jakobsen (2015) have shown that simply distributing information about why and how to co-produce did not have any effect on willingness to co-produce.

The use of ICT and social media affords great potential for facilitating client co-production (Lamph et al., 2018), easing communication and interaction (von Thiele Schwarz, 2016), and creating opportunities for the involvement of additional lay actors (Clark and Guzman, 2017; Meijer, 2012, 2014, 2016).

There is no reason to assume that digital technologies will always encourage co-production. Their impact is not straightforward and they can also be used to bypass interaction with citizens. Lember et al. (2019) define three potential scenarios: that digital technologies can augment, diversify or substitute for co-production. Sometimes service professionals and users have choices about how to design specific digital solutions for co-production, but in other situations, they do not have this opportunity or lack the ability to sense and seize it. Often choices about new technologies are made by third parties, rather than those who would co-produce.

4.3.4. Management of lay actors

Training, motivation-building (also aimed at enhancing self-efficacy), socialization, and group identity-building are important levers of the co-production management toolkit.

Effective training gives lay actors the confidence needed to co-produce the new service (Nederhand and Van Meerkerk, 2018). It is particularly important in knowledge-intensive industries, such as healthcare, where inadequate training can seriously constrain co-production (Essén et al., 2016).

4.3.4.1. Motivation processes. The complicated process of motivating users to participate requires the managing subject, in particular, their psychological and emotional efforts, along all the collaboration process (Petukiene et al., 2012; Mukherjee and Mukherjee, 2018). Petukiene et al. (2012) identify three material and eight non-material ways of motivating lay actors. The most commonly employed are appreciation expressed in person, appreciation/congratulations offered at public events; and events as a reward for client participation in the co-production of public services. It has been established that non-material forms of motivation are more closely linked with active client participation in services than material forms. Personal contact between the managing subject and the client is particularly important in the client motivation process. When co-producers do not feel well understood or get the impression that their efforts are not valued or useful, they might feel less inspired to actively contribute to and interact with co-production (Carey, 2013; Essén et al., 2016; van Eijk et al., 2017; Van Eijk, 2018; Parrado et al., 2013). Voorberg et al. (2018: 871) investigate the impact of financial incentives on people's willingness to coproduce, concluding that these can be considered effective measure to stimulate people to coproduce only to a limited degree. The authors recommend governments explore alternative possibilities for stimulating citizens' willingness to co-produce.

4.3.4.2. Socialization and group identity. Buttgen et al. (2012) suggest organizational socialization shapes users' beliefs and also influences their motivation to co-produce. Guo et al. (2013) explore the role of consumer socialization through three related processes: acquiring the knowledge of appropriate role behaviors or learning their role

expectations, acquiring relevant capabilities, and identifying with an organization's goals. These have differential effects on the compliance, individual initiative, and civic virtue of consumers and their satisfaction with the organization. Also, Bettencourt et al. (2002), concerning knowledge-intensive business services, propose socialization among the performance-enhancing tools at the disposal of the service provider that may be used to positively affect the user's role clarity, motivation, and/or knowledge, skills, and abilities. Frieling et al. (2014) propose to reinforce group identity by developing a shared vision of the outcome and the specification of concrete collective goals.

4.3.4.3. Control. Whereas co-production is believed to increase lay actors' perceived control (Stevens et al., 2017), few scholars have examined how organizations design their co-production operations for types and levels of user control, a factor that could substantively influence lay actors' affective responses, experience, and the service operation's success (Esmark et al., 2016). Moreover, greater user control means greater organizational uncertainty, which provider organizations may try to minimize by excluding particular groups of users (Fledderus et al., 2015).

4.3.5. Management of professionals

Professionals play an important role in co-production in that they are responsible for addressing the efforts of lay actors and sharing with them the responsibility for services (Burns, 2019). However, co-production challenges their traditional modus operandi and requires them to embrace new practices in which lay actors are equal partners with whom to share power over decisions and responsibilities (Verschuere et al., 2012; Williams et al., 2016; Kershaw et al., 2018). Consequently, to achieve the desired outcomes, it is necessary to establish specific professional co-production *training and motivational mechanisms* – a managerial tool that the literature review indicates has been generally overlooked – and to recognize the importance of encouraging active listening (Nederhand and Van Meerkerk, 2018). Bovaird and Loeffler (2012) recognize the “need to develop the professional skills to mainstream co-production”. Co-production calls for the revised training and development of public service professionals that need to be able to make use of the assets that clients and citizens offer (Tuurnas, 2015). A process of learning may be prompted by facilitating the exchange of professional and experiential knowledge among professionals (Tuurnas, 2015).

Socialization is also an important tool for professionals. Kershaw et al. (2018) found that professional bodies were able to successfully ‘theorize’ co-production in museums but were unable to diffuse it.

4.3.6. Leadership

The co-production literature has been recently focusing attention on the issue of leadership and power (McLennan, 2018), thus the role of leaders in the co-production of public value has to be further investigated (Brown and Head, 2018). Leadership in co-production is defined as ‘the ability to align different values and interests and to find a common ground’ (Ngo et al., 2019: 3) and is concerned with ‘framing the process, coaching the participants, and facilitating communication that allows them to understand how their tasks and efforts are part of a larger, collective task’ (Torfing et al., 2019: 20). Different types and styles of leadership have been identified (such as political, administrative, managerial, professional, civic, community) (Bussu and Galanti, 2018), highlighting their effect on co-production outcomes. O'Brien et al. (2017) finds that administrative leaders play a more critical role than political leaders in facilitating co-produced local public goods because they have an advantage in organizing community contributions. Their ability to mobilize community members, however, depends on their tenure in office. Both McLennan (2018) and Ngo et al. (2019) find out that leadership forms the solid backbone for other supportive aspects. Effective leadership from the regular provider's side brings a high level of width and depth of participation, improves equity, helps

mobilize financial resources, facilitates information exchange/communication, and increases benefits and decreases costs of participation for both lay actors and professionals (Vanleene et al., 2017).

In the co-production literature, public leaders are far more investigated than community leaders. Nuamcharoen and Dhirathiti (2018) find that the ones who professionally design services are prone to be more important in facilitating co-production. Capable community leadership can protect community initiatives against the risk that government involvement will 'kill or mutate' them (Brandesen and Honingh, 2016; McLennan, 2018). More knowledge is needed about the tools that public leaders can use and the impact that these tools may have (Torfing et al., 2019).

4.3.7. Accountability

Accountability in co-production is another complex issue on which the literature is rather silent.

4.3.7.1. Horizontal vs vertical accountability. Traditional accountability systems are based on the idea that the regular provider is the main actor to be held responsible. Therefore, to reflect the transfer of power to lay actors, the advent of co-production has led to the need for new forms of horizontal accountability (Meijer, 2016; De Witte and Geys, 2013).

4.3.7.2. Performance management system. Accountability systems need to be supported by performance management systems designed to monitor different dimensions such as inputs, processes, outputs, and intermediate and outcomes (Sorrentino et al., 2017). However, the difficulty of measuring outcomes can hamper the adoption of a results-driven management system hence also the understanding of the differential benefits coming from co-production. Finally, concern over public accountability can 'easily lead governments to conclude that it is too risky to get involved with, or even to allow, citizens' initiatives in a certain policy domain' (Brandesen and Honingh, 2016).

4.4. Co-production outcomes

The first attempts to evaluate co-production outcomes for the regular provider can be traced back to Brudney's seminal works (1983, 1984) that identified six main outcome areas (tax savings, service effectiveness, citizen participation, motivating service-directed behavior, training and coordination arrangements, and service equity).

The analysis of the literature published so far informs that co-production can generate different outcomes for the different actors affected by co-production: the lay actors, the regular service provider, and the community at large.

4.4.1. Lay actors

The literature identifies different lay actors' outcomes, such as satisfaction, empowerment, awareness, learning, cost, and externalities. For each of these, the main findings of previous research are briefly analyzed.

4.4.1.1. Satisfaction. The effects on the lay actors include satisfaction with the process of co-production and with the service co-produced. How the process of co-production is designed affects customer experiences, influencing people's enjoyment and satisfaction with the interaction. The potential psychological response of lay actors to participation and the self-serving bias effect (Bendapudi and Leone, 2003) have to be taken into consideration when designing the co-production process. Specifically, an increase in the users' perceived control can mitigate the bias and increase satisfaction (Stevens et al., 2017; Pacheco et al., 2017). The level of perceived co-production intensity (i.e., nonmonetary customer input, such as perceived effort and time invested) can negatively affect customer satisfaction with the co-production process (Wu, 2011). Intensity drawbacks can be mitigated

by triggering customer beliefs that they collaborate with the provider to achieve a shared goal (Mende et al., 2017) and by making regular producers' efforts visible during the entire process of co-production (Fledderus et al., 2015). The satisfaction of lay actors with the service produced is one of the most frequently examined outcomes of co-production both in the public- and private-sector studies. The literature identifies the following key factors that influence the lay actors' behavior and satisfaction with the co-production process and outcomes, such as the type of output and level of service co-produced (Xu et al., 2018; Troye and Supphellen, 2012); the different features of service outputs (specific rather than generic) (Dong & Sivakumar 2015); the specific typology of service and social-network-based service (Park et al., 2018).

4.4.1.2. Empowerment and awareness. Although widely empirically examined as antecedents related to lay actors, only recently has literature provided evidence on an increase in empowerment (individuals' belief in their ability to perform a task) as a specific outcome of co-production studies by Jo and Nabatchi (2019). The same study reports an increase in participants' levels of issue awareness (lay actor's involvement, interest, and education about issues), particularly in the context of collective co-production.

4.4.1.3. Learning. The increased learning rate of lay actors of a co-produced service enables customers to become more efficient co-producers. Evidence come from private sector ICT-driven services (Field et al., 2012).

4.4.1.4. Lay actor costs. Literature offers scant empirical evidence on this aspect. According to the Loeffler and Bovaird (2018) classification, there are six categories of costs related to different aspects of lay actor participation in co-production: costs of learning about co-production opportunities, costs for training activities, costs related to managing operations, costs for monetary donating, costs related to social and psychological changes in their lifestyle.

4.4.1.5. Externalities. Bovaird et al. (2015) suggest evaluating also the externalities in consumption, i.e., the impact of co-production on those indirectly affected by the consumption of public goods, such as those close to the lay actor who benefit from the improved outcomes and other users who learn how to make better use of the service from the example set by the co-producers. Nevertheless, both the public- and the private sector literature argue that co-production is not without drawbacks for lay actors, some of whom may perceive co-production as simply another form of back-door privatization (Bovaird et al., 2017; Zolfagharian et al., 2018). Co-production also has been found to undermine satisfaction and trust (Fledderus et al., 2015), while in a private-sector study, Essén et al. (2016) suggest that when skilled tasks are split into smaller tasks completed by unskilled labor, co-production can benefit providers at the expense of 'duped' consumers.

4.4.2. Regular service provider

Co-production is also expected to promote significant potential benefits for the regular provider. The main types of regular provider outcome can be classified as follows: cost-efficiency, effectiveness, effects on the workforce, environmental uncertainty, and trust.

Cost efficiency is related to the unit costs of service production and its productivity, measured as the relationship between costs of input (personnel, equipment, etc.) and the related output (the amount of service and its quality). Cost savings mainly derive from the replacement of the work of the professionals by the unpaid inputs and efforts of the lay actors. In the public sector, providers may economize on their internal resources thanks to citizen input, making public service agents free to pursue other functions, and increasing overall service productivity. It must be noted, however, that replacing professionals with

volunteers means that some of the costs are fully eliminated but shifted to the lay actors (Pestoff, 2009). Inappropriate or undesired offloading of cost, risk, and responsibility by the government to citizens may occur (McLennan, 2018). This is true also in the private sector, where customers should perceive the value, they gain from co-production to be at least commensurate with the effort made in their co-producer role (Hilton, 2008). On the other hand, the co-production process increases regular provider's direct and tangible costs associated such as: staff training and costs of the assistance to be provided to the lay actor co-producers; operational costs to design and implement service delivery, and transactional costs to steer and sustain lay actors in the co-production process over time (Sorrentino et al., 2017). A reduced effort on such tasks could drive to a 'perception of chaos', risks compromising the expected benefits, and increasing the "political" costs of co-production (Bartenberger and Szescilo, 2016). Other costs may be related to specific co-production investments and infrastructure to allow lay actors to deploy their contributions (Hilton, 2008). Particular relevance is given to ICT (Lember et al., 2019), even though evidence of their impact to improve provider's efficiency or performance management capacity is not straightforward (Clark and Guzman, 2017).

4.4.2.1. Effectiveness. The potential of co-production to increase public service quality has been widely reported (Bovaird and Loeffler, 2012). Co-production increases service quality, especially in knowledge-intensive sector (Bettancortu et al., 2002, Mustak et al., 2016), and also mitigates potential negative reactions in the event of a provider's service failures (Koc et al., 2017). Co-production positively affects organizational adaptability and flexibility and advancing innovation (Hsieh and Hsieh, 2015; Osborne et al., 2015). Private-sector research has attempted to assign a monetary value to service quality as perceived by users; evidence suggests that co-produced products lead to higher prices (measured through a willingness to pay), as the quality and value perceived by users are affected by self-extension, the feeling that the product is part of people (Walasek et al., 2017). Whether the public service users are willing to pay more for a product/service that they co-produce (through higher taxation or service fees) is an aspect that remains unexplored.

4.4.2.2. Effects on the workforce. The impact of co-production on the regular provider's workforce has little been investigated (Tuurnas, 2016). Employee satisfaction can be increased through deep acting (Wu, 2011) which pertains to experiencing the expected emotions in contrast with the surface acting that shows emotions not really internalized by employees.

4.4.2.3. Environmental uncertainty. Co-production, by giving users more say in the service outcome, may cause greater uncertainty (Dong & Sivakumar 2015; Fledderus et al., 2015). Conversely, van den Bekerom et al. (2016) argue that co-production can moderate the effects of environmental turbulence on organizational performance.

4.4.2.4. Trust. The fact that co-production modifies the relations between government and citizens and among the citizens themselves challenges the existing sources of legitimacy, with the risk of a hidden transfer of power to 'amateurs' without accountability (Meijer, 2016), not necessarily lead to the expected increase in service delivery, trust in (local) government or generalized trust (Fledderus et al., 2015) regardless of citizens' awareness of voluntary or non-voluntary forms of co-production (Kang and Van Ryzin, 2019).

4.4.3. Community

To ascertain whether the co-produced service has achieved the desired benefits, it is necessary to evaluate the outcome for the community, or the collective citizenry (Bovaird et al., 2015; Alford, 2016; Nabatchi et al., 2017). Despite the trickiness of assessing and measuring

the impact of co-production at the community level, moving from the Bovaird and Loeffler (2012) and Dudau et al. (2019) frames, performance dimensions are grouped into value to the community, value to society, and social economic impact.

4.4.3.1. Community value. The community value is related to the development of social capital (Levine and Fisher, 1984; Marks and Lawson, 2005; Osborne et al., 2016) that takes place through different channels (Levine and Fisher, 1984; Osborne et al., 2016). Co-production may help citizens better understand service costs and government procedures and constraints and, in doing so, abate the inherent distrust of citizens in regular service providers (Sudhipongpracha and Wongpredee, 2016). Co-production, especially when it implies the collective actions and interaction of individuals, may help develop new social bonds and revitalize a communitarian spirit and a vision of what the community should become and act in the future (Cutcher, 2010). Some trade-offs occur comparing community and user-led co-production, the first being more effective in increasing social capital, but also more challenging for the regular provider in building connections between citizens themselves and also between citizens and the service provider (Loeffler and Bovaird, 2018).

4.4.3.2. Value to society. Three different outcomes can be ascribed as having societal value: the democratization of public service, equity in distributional consequences, and legitimacy and public acceptance.

Democratization of public services occurs through the involvement of citizens in any phase of the service cycle (Bartenberger and Szescilo, 2016; Pestoff, 2009; Brudney, 1983, 1984). However, co-production does not operate through formal democratic channels and so may pose a threat to, rather than complement representative democracy (Loeffler and Bovaird, 2016).

The *risk of inequality* in the distribution or allocation of benefits has been quite debated in the literature (Brudney, 1983; Grabosky, 1992; Meijer, 2016; O'Brien et al., 2017; Akaateba et al., 2018). Barbera et al. (2016) consider responsiveness and representation necessary for avoiding the prevalence of specific interests. Vanleene et al. (2018) discuss how co-production in community development projects may lead to more inclusion, empowerment and equity. Co-production management, including the methods used to select co-producers, services and activities, can exacerbate the gap between service outcomes for advantaged and disadvantaged citizens (Jakobsen and Andersen, 2013). Cepiku and Giordano (2014) show that gender non-representativeness of lay actors resulted in a disproportionate service provided to women. Co-production clashes with traditional values that the professionals deem crucial, such as equity, representativeness, and the neutrality of public service activities (Bussu and Galanti, 2018; Tuurnas, 2015).

Finally, the effects of co-production on *legitimacy and public acceptance* are controversial. While involving stakeholders contributes to greater legitimacy and an increase in public support for a project, there is evidence of a decreased level of acceptance (Bartenberger and Szescilo, 2016).

4.4.3.3. Social economic impact. The social economic impact can be evaluated giving a monetary value to the collective outcomes. This value has been generally measured by assessing the implied tax savings (Brudney, 1983) deriving from the lower cost of public service co-production initiatives (Loeffler and Bovaird, 2016; Shandas and Messer, 2008). It could also be evaluated by adopting cost-benefit analysis and a social return on investment approach.

Table 3 sums up the main evidence coming from this systematic literature review per each of the four pillars.

Table 3
The main evidence and references related to pillars, components and sub-components.

	Components	Sub-components	Main evidences	Main references
General context	General context	State and governance tradition	Authoritative consultative style seem to speed up the coproduction process	Jo and Nabatchi 2016; Lijphart, 2012; Voorberg et al., 2018; Parrado et al., 2013; Pierre, 1995; Sudhipongpracha and Wongpredee 2016
		Regulatory framework	Law is an enabler of coproduction	Szescilo, 2018; Chaebo and Medeiros, 2017
Antecedentes	Lay actors (citizens, clients, customers)	Nature of welfare state	When there are no reform mining welfare state people tend to coproduce lower.	Pestoff 2009; Rantamaki, 2017
		Economical social infrastructural	coproduction is more likely to take place when governments cannot afford the provision of public services due to a lack of financial resources. Instead social capital is a positive moderator	Chaebo and Medeiros, 2017; Andrews and Brewer 2013; Munoz et al., 2014
		Demographic and socio-economic characteristics	Contrasting evidence: some studies found a positive relationship between these variables and coproduction, while others find non-significant effects	Alford and Yates (2016), Alonso et al. (2019), Bovaird et al. (2015, 2016), Christensen and Lægread (2005), Jakobsen and Andersen (2013) Jakobsen and Andersen (2013), Parrado et al. (2013), Riccucci et al. (2016), Van Eijk and Steen (2016), Van Ryzin et al. (2017), Warren et al. (1984).
		Motivational factors	Material self-interest (e.g., monetary rewards) has been shown in many cases not to positively affect coproduction mainly due to crowding-out effects Non-material rewards (prosocial behaviours, intrinsic motivations, sociality, normative commitment, intrinsic motivations) foster coproduction	Alford (2002, 2009), Bovaird et al. (2015), Bovaird et al. (2016), Hattke and Kalucza (2019), Parrado et al. (2013), Sharp (1978), Van Eijk and Steen (2016), Vanleene et al. (2017), Verschuere et al. (2012).
	Regular service provider	Socio-psychological factors	Self-efficacy fosters coproduction, although this appears to be true under specific circumstances	Alford and Yates (2016), Alonso et al. (2019), Bovaird et al. (2015), Bovaird et al. (2016), Fledderus and Honing (2016), Fledderus et al. (2015), Hsu et al. (2013), Li and Hsu (2017), Parrado et al. (2013), Thomsen (2017).
		Resource availability	When lay actors have access to information and basic resources, they are more likely to coproduce. Lack of time availability seems to constrain coproduction	Alford (2002, 2009), Brudney (1983), Cepiku and Giordano (2014), Hunt et al. (2012), Jakobsen and Andersen (2013), Kaehne et al. (2018), Morton and Paice (2016), Percy (1984), Sharp (1980), Thomsen (2017). Cassia and Magno (2009).
	Service-related characteristics	Degree of citizen orientation	Public official citizen orientation is conducive to the implementation of coproduction	
		Official acceptance of an active role of lay actors	Awareness of handling specialized knowledge in the service nurtures professional reluctance to share their power over service provision representing a barrier to coproduction. By contrast, openness to interaction with lay actors and to adopting new ways of providing services can enhance coproduction.	Parrado et al. (2013), Ryan (2012), Sicilia et al. (2016).
		Organisational culture	Propensity to innovation, flexibility and risk-taking support coproduction	Voorberg et al. (2015).
		Continuity and duration	More endurable services imply that beneficiaries are more interested in their development and quality and thus tend to coproduce more	Bovaird and Loeffler (2012), Pestoff (2012, 2014).
Coproduction management and implementation	Institutional arrangements (Service delivery channels, formal rules, intensity, size and scope)	Ease of activities to be performed	When the tasks to be performed are easy, lay actors are more willing to coproduce. This should also be accompanied by ease of involvement	Bovaird et al. (2015), Pestoff (2012), Vanleene et al. (2017).
		Perception of service saliency	People tend to coproduce more when a service is relevant to them, such as when it has a direct impact on their life or on the lives of people they care about (e.g., family members, friends)	Pestoff (2012), Van Eijk and Steen (2014, 2016).
	Service delivery channels	A structured participation process ensures: decreased uncertainty and risks; enhanced perceived ability; and more equitable relationships. It minimises communication costs and miscommunication risks. Lay actor learning can be designed into the service delivery system by encouraging the use of channels with complementary learning effects and discouraging channel substitution.	Flores and Vasquez-Parraga 2015; Field et al., 2012; Morton and Paice 2016; Dong and Sivakumar 2015	
	Formal rules	Coproduction selection rules affect representativeness of lay actors and professionals. Rules that allow immediate sanction for failures of reciprocity are	Brandsen and Helderma 2012; Cepiku and Giordano 2014; Dong and Sivakumar 2015; Warren et al., 1984; Workman 2011; Lierl 2016.	

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Table 3 (continued)

Components	Sub-components	Main evidences	Main references	
Planning	Intensity, size and scope	important especially when there are low levels of trust. Coproducton intensity, size and scope negatively affect a lay actor's self-efficacy, loyalty and satisfaction with the coproduction process.	Haumann et al., 2015; Jakobsen and Andersen 2013; Mende et al., 2017; Pestoff 2014; Sichtmann et al., 2011; Stokburger-Sauer et al., 2016.	
	Planning	Allows regular producers and lay actors to come to a shared understanding of the focus and purpose of coproduction activities and to avoid being directed towards divergent or even conflicting ends.	Frieling et al. (2014).	
Communication strategies	Modes	Communication modes may address unresolved epistemic differences across professional and lay actors.	Owens and Cribb 2012; Spanjol et al., 2015; Thomsen and Jakobsen 2015; Essén et al., 2016; Hsieh and Hsieh 2015; Parrado et al., 2013; Shandas and Messer, 2008; Sorrentino et al., 2017	
	Use of ICT	The use of ICT may facilitate co-production leading to an increase of co-production but sometimes it can also be a substitute. Technology are not always chosen by co-producers	Clark and Guzman 2017; Clark and Guzman, 2017; Essén et al., 2016; Lember et al., 2019; Meijer, 2016; 2012, 2014; von Thiele Schwarz, 2016; Pors, 2018 .	
Management of lay actors	Traning	Effective training gives lay actors the confidence and ability needed to coproduce the new service. It also promotes role clarity.	Nederhand and Van Meerkerk 2018; Essén et al., 2016	
	Motivation	Motivation affects activeness in coproduction behaviours. It's a complicated process that can be applied using both material and non material solutions.	Mukherjee and Mukherjee 2018; Petukiene et al., 2012; Carey 2013; Essén et al., 2016; van Eijk et al., 2017; van Eijk 2018; Ford and Dickinson, 2012; Van Eijk 2018; Parrado et al., 2013; Essén et al., 2016; Voorberg et al., 2018 Bettencourt et al., 2002; Buttgen et al., 2012; Guo et al., 2013; Otten and Moskowitz, 2000; Frieling et al., 2014	
	Socialization and group identity	Socialization may shape users' beliefs and also to influence their motivation to co-produce. In particular group identity seems to be an effective strategy to enhance co-production		
Management of professionals	Control	Underinvestigated strategy. It may reduce uncertainty.	Stevens et al., 2017; Esmark et al., 2016; Fledderus et al., 2015	
	Traning and motivation	Training and motivation of professionals address their lack of skills to mainstream coproduction and their reluctance to share power and control with users and communities.	Bovaird 2007; Bovaird and Loeffler, 2012; Kershaw et al., 2018; Ryan, 2012; Sicilia et al., 2016; Tuurnas 2016, 2015; Verschuere et al., 2012; Williams et al., 2016.	
Leadership	Socialization	Socialization may help to facilitate co-production	Kershaw et al. (2018)	
	Types and styles of leadership	Types of leadership influences width and depth of participation, equity improvement, availability of financial resources, participation costs. Capable community leadership can protect community initiatives against the risk that government involvement will 'kill or mutate' them.	Brandsen and Honingh 2016; McLennan 2018; Nuamcharoen and Dhirathiti 2018; Bussu and Galanti 2018; Ngo et al., 2019; Torfing et al., 2019; Vanleene et al., 2017	
Accountability	Horizontal vs Vertical	The advent of co-production has led to the need for new forms of horizontal accountability considering to transfer power to lay actors	Meijer 2016; De Witte and Geys 2013	
	Performance management systems	Lack of performance measurement and accountability can hamper the understanding of the difference between coproduced and non-coproduced services, and the transparency of the outcomes achieved.	De Witte and Geys 2013; Meijer 2016; Sorrentino et al., 2017; Tuurnas 2015.	
Outcome	Lay actors	Satisfaction	Satisfaction with coproduced process is negative due to self-serving bias. Some factors can mediate the bias and increase satisfaction: lay actor perceived control; lay actor perceived intensity of coproduction. Quality of outcome directly impacts satisfaction; in case of negative or ambiguous outcome, self-integration can mitigate the negative impact. Specific service features (vs generic) output increase satisfaction (but decrease regular provider productivity) Service recovery increase satisfaction. Social-network-based service negatively affects satisfaction.Type of coproduction does not directly impact satisfaction	Bendapudi and Leone (2003), Esmark et al. (2016), Etgar (2008), Fledderus et al., 2015, Flores and Vasquez-Parraga (2015), Haumann et al. (2015), Mende et al. (2017), Pacheco et al. (2017), Stevens et al. (2017), Stokburger-Sauer et al. (2016), Wu (2011), Wu (2011). Zolfagharian et al. (2018). Dong and Sivakumar (2015), Dong and Sivakumar (2015), Lindenmeier et al. (2019), Pacheco et al. (2017), Park et al. (2018), Pestoff (2012), Troye and Supphellen (2012), Xu et al. (2018).
		Empowerment	Coproducton increases lay actor empowerment	Cepiku and Giordano (2014), Essén et al. (2016), Ford and Dickinson (2012), Frieling

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Table 3 (continued)

Components	Sub-components	Main evidences	Main references
Regular service provider	Awareness	Coproduction increases participants' levels of issue awareness	et al. (2014), Jo and Nabatchi (2019), Sorrentino et al. (2017). Jo and Nabatchi (2019).
	Learning	Coproduction enables customers to become a more efficient co-producers	Field et al. (2012).
	Lay actor costs	Costs of learning about co-production opportunities, costs for training activities, costs related to managing operations, costs for monetary donating, costs related to social and psychological changes in their lifestyle	Loeffler and Bovaird (2018)
	Externalities	Externalities are likely to be higher in collective than in individual coproduction	Bovaird et al. (2015).
	Cost-efficiency	Trade-offs between cost-efficiency driven by workforce savings and costs of citizen input. Coproduction increases: staff training and assistance costs, operational and transactional costs. Coproduction increases capital costs, specifically on ICT. Evidence of effects of digital technologies on cost efficiency is diverging	Andrews and Brewer (2013), Brudney's (1983, 1984), Frieling et al. (2014), Hilton (2008), Hoyer et al. (2010), McLennan (2018), Pestoff (2014), Prahalad and Ramaswamy (2000; 2004), Thomsen (2017), Zambrano-Gutiérrez et al. (2017), Bartenberger and Szescilo (2016), Hilton (2008), Loeffler and Bovaird (2016), Sorrentino et al. (2017), Thomas (2013). Andrews and Brewer (2013), Bovaird et al. (2016), Clark and Guzman (2017), Hilton (2008), Lember et al. (2019), Lember et al. (2019), Linders (2012), Loeffler and Lember et al. (2019), McLoughlin et al. (2009).
	Effectiveness	Coproduction increases service quality, especially in knowledge intensive sector and also mitigates potential negative reactions in the event of a provider's service failures. Coproduction positively affects organisational adaptability and flexibility and advancing innovation	Bettancortu et al. (2002), Bovaird and Loeffler (2012), Koc et al. (2017), Mustak et al. (2016), Palumbo (2016), Radnor et al. (2014), Troye and Supphellen (2012), Walasek et al. (2017), Boyle and Harris (2009), Hsieh and Hsieh (2015), Osborne et al. (2015)
	Effects on workforce	Employee satisfaction can be increased through deep acting and decreased using surface acting	Wu (2011).
	Environmental uncertainty	Coproduction may moderate or even offset the negative effects of environmental turbulence on organisational performance	Fledderus et al. (2014), van den Bekerom et al. (2016).
	Trust	Theoretical works suggest that coproduction of public services may generate greater trust. Empirical evidence provides divergent results	Fledderus et al. (2014), Fledderus et al. (2015), Kang and Van Ryzin (2019).
	Community	Value to community	Coproduction enhances social capital with some trade-offs comparing community and user-led coproduction
Value to society		Coproduction challenges: The democratization of public service; The risk of inequality in the distribution or allocation of benefits coming; The existing sources of legitimacy	Bartenberger and Szescilo (2016), Brudney (1983, 1984), Loeffler and Bovaird (2016), Pestoff (2009). Akaateba et al. (2018), Brudney (1983), Grabosky (1992), Jakobsen and Andersen (2013), Meijer (2016), O'Brien et al. (2017). Barbera et al. (2016), Bussu and Galanti (2018), Cepiku and Giordano (2014), Vanleene et al. (2018), Tuomas (2015). Bartenberger and Szescilo (2016), Meijer (2016).
Social economic impact		Coproduction implies tax savings. Other benefits could be captured using cost-benefit analysis and social return on investment	Brudney (1983), Loeffler and Bovaird (2016), Loeffler and Bovaird (2018), Shandas and Messer (2008).

5. Discussion

Notwithstanding the growing scholarly interest in co-production, there is a lack of a specific comprehensive framework (Bovaird et al., 2015; Brandsen et al., 2018). Through a systematic and qualitative review of the co-production literature, this paper has provided a distinctive theoretical framework for the activation, management, and evaluation of co-production that would advance the understanding and analysis of the interrelated dynamics at play, and how these change in time.

Our review has shown that the general context has attracted the attention of public sector scholars. In particular, elements that have been recognized as important are: political systems, views on the role of government, financial health, legal and institutional frameworks, and

socio-economic and cultural issues. Often general context has been analyzed jointly with antecedents, however, not because of their relationships but because both of them were considered enablers or moderators of co-production. With few notable exceptions like Parrado et al. (2013) which stressed that both the intention to co-produce and the actions put in place by governments are contingent and vary between sectors and nations. This suggests co-production is a context-dependent phenomenon and paves the way to further analysis to investigate the relevance of other elements, the relative importance of each element and the magnitude and direction of their influence on the practices of co-production.

The model clusters the antecedents about the lay actors, the regular provider, and the service that is co-produced. In particular, scholars have focused their research mainly on the lay actor, investigating the

conditions that affect their willingness to participate in co-production activities. However, it is not clear how the different antecedents interact in facilitating or hampering the lay actors' behavior. Studies have identified several characteristics of regular providers as enablers for co-production. However, there is a need to further investigate how these characteristics and their combination may affect not only the activation of co-production but also its management and the consequent outcomes.

Less attention has been addressed to the type of service and its relation to the activation, management, and evaluation of co-production. The analysis has shown that some characteristics of services affect the willingness to co-produce (ease of tasks to be performed, service salience, and continuity and durability of needs). Future studies should provide further evidence that these service characteristics are conducive to co-production. Moreover, a knowledge gap should be filled concerning under which conditions co-production can be activated for services that do not reflect the above-mentioned features.

Some context elements and antecedents can be more easily managed through specific co-production management levers (such as the level of knowledge and skills of co-producers), others require a longer time to be modified (such as the motivation of professionals) and some others are not directly influenced/modifiable. Future research should investigate if and under which conditions specific co-production management levers positively affect the context of co-production and the willingness of lay actors and regular providers to co-produce.

Thus, the framework includes, as a second dimension, the co-production management, i.e. those institutional arrangements, communication strategies, management of the lay actors and the professionals, leadership and accountability systems, which play a key role for the success or failure and the sustainability of the co-produced service. The analysis shows a large interest by public sector scholars in the four components (institutional arrangements, communication strategies, management of lay actors, and management of professionals). Leadership and accountability have received less attention.

When co-producing, the regular providers need to rethink institutional arrangements specifically regarding: the design of service delivery channels and structure; the formal rules governing the interaction between lay actors and regular providers, especially their professionals; the intensity, size and scope of co-production. The service delivery channels and intensity have been largely overlooked in the public sector. Private sector literature provides insights on how to mitigate the negative effects of the effort required from high intensity co-production. These should be tested in the public sector realm.

Instead, public sector literature has focused mainly on the co-production of formal rules such as eligibility criteria, the definition of boundaries and the allocation of responsibilities. However, how the division in responsibility between the regular producer and service users may affect their willingness to co-produce, their satisfaction and trust remained unexplored and require further investigation.

Despite the communication strategies have received growing interest from scholars, especially in the last years with the advent of digital technologies, there is a lack of evidence on their actual impact on co-production.

Looking at people management in co-production, what emerges is a high interest in the characteristics, behaviors and effects on lay actors compared to scarce attention to professionals. Classifying lay actors as temporary employees is at odds with the fact that they do not fit in the organizational hierarchy like employees. It indicates the need to rethink traditional tools like training and motivation-building. Likewise, it may be necessary to upgrade the organization's marketing and communication systems by, for example, setting up a dedicated communication channel for the lay actors. While it has been observed that public service professionals play an important role as initiators and coordinators of co-production, they do not receive the same level of attention in terms of characteristics, behaviors and outcomes as the lay actors. Indeed, little is known about the leadership behaviors and skills needed to guide and sustain co-production over time, which is surprising given that public

service professionals are key players in the implementation and coordination of co-production. Moreover, co-production theory needs to move beyond its focus on government-led co-production and investigate the role of community leadership in establishing the conditions for effective community-led co-production.

There is a paucity of research on the use of accountability as a co-production management tool. Future research can benefit from the blame-avoidance literature (Hood, 2007) and from the more general literature on performance measurement in networks.

Finally, as depicted in Table 3, scholars delved a great effort in discussing the co-production outcome dimension.

Literature considered co-production as a benefiting end in itself; nonetheless this framework represents the first attempt to provide a clear categorization of the outcomes according to the three categories of stakeholders: the lay actors, the regular service provider, and the community. This contribution can be used as a blueprint for developing a multidimensional performance measurement system that factors in different perspectives.

Private literature on the lay actor and the regular provider outcomes of co-production, mainly refers to the costs, efficiency and users' satisfaction of co-production. These studies could provide a starting point for developing similar measures for the public sector.

Finally, community is a distinctive component of the co-production outcomes in the public sector. In this respect, the literature has identified several performance dimensions; this framework is the first attempt to provide a classification using the following components: value to community, value to society and social economic impact. Yet, there is need of empirical evidence to assess the impact of co-production at the community level.

Another area of research that has been neglected pertains to the relationships among the different outcome types and within. Outcomes can self-reinforce each other or manifest trade-offs, also between short- and longer-term co-production results. What are the trade-offs, when these can be encountered and how they can be managed are interesting topics to investigate.

In addition to identifying the main variables investigated by the co-production literature and part of the framework, an effort is made to highlight the dynamics that drive the different components and how they interrelate.

There are papers investigating both outcomes and management levers or antecedents. However, further research avenues can be drawn considering how the different components interrelate. For instance, theoretical works suggest that co-production of public services may generate greater trust (Fledderus et al., 2014) while empirical evidence provides divergent results (Kang and Van Ryzin, 2019).

Addressing these gaps, the theoretical framework presented in this article makes several contributions.

First, the framework suggests that the general context and the antecedents of co-production act at different times: several influence the willingness and propensity to co-produce, some emerge during the interaction to influence the collaboration dynamics, yet others condition the final outcomes for the co-producers or the community at large. Moreover, they act in combination rather than in isolation.

Second, the characteristics of the general context and the antecedents can either facilitate or complicate the co-production management effort, the ways in which co-production is managed will shape the final outcomes and also feedback into the antecedents (e.g., level of participant trust). Interrelated dynamics between co-production management and implementation and antecedents require further investigation. For instance: Which collaboration management tools are more effective in addressing particular challenges posed by the general context and especially the antecedents? Which institutional arrangements work best when trust among the participants is low? How can the management of the collaborating actors (lay actors and professionals) address representativeness issues? What combinations of co-production management tools are more effective? Can communication mitigate the negative

effects of high-intensity co-production and how? Which are the most effective motivation-building mechanisms vis-à-vis lay actors' characteristics?

Third, the relationships between the different outcome types, have been neglected. Outcomes can reinforce each other or manifest trade-offs, including between short and longer terms co-production results. What those trade-offs are, when they emerge and how they can be managed are interesting topics to investigate. What are the effects of the different co-production management levers on outcomes, remain, among others, unanswered questions. Moreover, it would be interesting to address these questions looking not only at co-production initiatives at a certain point in time but also assuming a dynamic and longitudinal perspective.

Fourth, future research should also trace a linkage across all the components providing insights on strategies and tools that help guaranteeing the sustainability of co-production in the long run from a systemic perspective highlighting the results of the multi-actors and their relationships.

Finally, these research avenues should be addressed, not just at a fixed point in time but also from a longitudinal perspective.

From a methodological point of view, a wide range of empirical approaches could be applied. In particular, longitudinal case studies are useful to better understand the evolutionary path and dynamics of co-production over time. Moreover, analyses that take on a configurational approach may highlight how multiple factors interact in co-production, going beyond one-to-one relationships. Finally, the combination of quantitative and qualitative approaches is apt for the maturity level of the topic to make a robust and valid understanding of co-production (Battaglio and Hall, 2018).

This work is not free from limitations. A limit consists in the period analyzed in the literature review (up to 2019). To mitigate this limitation, we read the articles and the literature reviews recently published and we can confirm that the framework is novel in this field. However, we cannot exclude that further research may add other components which are currently missing or other examples. Another limitation consists in the fact that we did not group findings using the well-known classification of co-production referred to the four phases of co-production (commissioning, design, delivery and assessment). For the sake of brevity and clarity, we decided to report results using only the novel classification brought from the collaborative governance literature. However, further investigation may also include additional classifications such as the four co-production stages or the substitutive or additive role of co-production as well as the type of co-production interaction, relational or transactional.

6. Conclusions

Drawing from a systematic literature review, this paper is an attempt to classify and develop the main co-production concepts into a comprehensive framework that strengthens the understanding and analysis of co-production and its outcomes. It has also revealed critical research gaps that scholars should address in order to increase our knowledge about the activation, management and evaluation of co-production. In particular, scholars might use the dimensions of the framework depicted in the paper and the research gaps to develop propositions and explore the cause-effect relationships among the variables.

Finally, the framework proposed in the article has also implications for scholars, policy makers, and public managers and contributes to the cleaner production concept. While most of the literature specializes in one of the actors: the government (policies and legislation), business (production), or citizens (waste production and consumption of key resources), it is in their interaction that value is created (or destroyed). Therefore, further attention must be paid to the interaction and collaboration of the key actors.

The theoretical framework provides a conceptual map to better

understand, manage, and assess co-production. Moreover, it offers a clear lens for the implementation of a co-produced service, supporting the decision-making process by identifying the actions needed to purposefully engage the participation of the lay actors and to train and motivate the professionals. Ultimately, by categorizing the potential outcomes of co-production, the model serves as a useful and relevant frame of reference for the measurement and evaluation of co-produced services in the public sector. Finally, the paper suggests that co-production is a complex and risky service delivery arrangement, and its success highly depends on the ability of public managers to read the specific contexts and mix the managerial levers in a way that facilitates the initiation and implementation of co-production and secure the achievement of expected outcomes.

Declaration of competing interest

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

Data availability

No data was used for the research described in the article.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jclepro.2022.135056>.

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