A Comparison of Antecedents of Different Types of Innovation – V

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ABSTRACT

Antecedents of innovation precede their implementation and probably influence which innovations and whether they are approved and implemented. Antecedents have been identified in a considerable number of types of innovation. Are they the same in these types? A systematic literature review (SLR) of antecedents of policy innovation found 594 antecedents, 508 of them unique, in 87 articles on trailblazing and adoption. So many antecedents suggest a lack of clarity about what the antecedents of policy innovation may be. They have been clarified for policy innovation. In this paper the antecedents of policy innovation are compared to antecedents of private, public sector and social innovation identified in literature reviews, SLRs and meta-analyses to see whether common or different antecedents are identified in these literatures. While the literature often implies antecedents of different types of innovation are the same by lumping them together, they were found to vary somewhat by type of innovation, especially trailblazing and higher-level factors and clusters. External antecedents were only found to be important for policy innovation and dissemination; political antecedents were particularly important for trailblazing; internal antecedents were important for all types of innovation. Literature on antecedents of private innovations did not consider external or political antecedents. Four research questions are addressed: *Q. 1*: At what level should antecedents of innovation be analyzed and compared? Q. 2: How do antecedents identified for different types of innovation compare—private, public and public-social sectors? *Q. 3:* How do clusters identified for different types of public sector innovation compare— processes; trailblazing and adoption of policy; dissemination; private, public, public-social sectors? *Q. 4:* Do a common set of unique and grouped antecedents, factors and clusters influence all types of innovation equally or are their antecedents discernably different?

Key words: antecedents of innovation, comparison of antecedents, types of innovation, systematic literature review.

Introduction

Antecedents of innovation precede innovation's implementation and probably influence which ones and whether they are approved and implemented. Understanding innovation's antecedents is therefore an important aspect of understanding innovation. Antecedents have been identified for a considerable number of types of innovation—private sector, public sector, process, policy, social—and a large number of them have been identified; e.g. Glor (2021a) identified 508 unique antecedents in 87 public policy innovation publications. Are the antecedents the same in these types of innovation literature? The literature often implies antecedents of different types of innovation are the same by merging them, e.g. as public sector

innovation rather than as process and policy public sector innovation. In this paper the types are separated as possible and their antecedents are compared to see whether their antecedents are the same/similar or different and how they are the same or different.

A number of publications have identified antecedents of innovation, sufficient numbers that they can now be compared to each other. The types of innovation and their antecedents are identified from literature reviews, SLRs, meta-syntheses and meta-analyses. The terms SLR and meta-analysis originated in the health literature using levels of evidence that create an evidence hierarchy. "Levels of evidence" was first used in the report by the Canadian Task Force on the Periodic Health Examination (1979) and identified three levels of evidence. A more recent hierarchy identified SLRs and meta-analyses (of randomized control trials) as the highest level of evidence (Ackley, Swan, Ladwig and Tucker, 2008: 7).

Types of Studies

The study reviews antecedents identified in reviews of private, public and social sector innovation literature. The term social sector refers to that part of social and economic activity done for the purpose of benefiting society. It is funded, in part or whole, through charitable gifts. As in the health literature, the innovation literature includes several types of analyses: quantitative, qualitative and expert opinion. A SLR is a "review of a clearly formulated question that uses systematic and explicit methods to identify, select and critically appraise relevant research, and to collect and analyze data from the studies that are included in the review. Quantitative studies that accumulate data can be studied through meta-analyses" (Moher et al, 2009). This study identifies what scholars and practitioners have concluded are the antecedents of innovation; they do not use the same methodologies but topics.

The study summarizes the literature to identify similarities and differences in the antecedents identified, uses a classification system of antecedents (Glor, 2021c), identifies the levels of consideration used and identifies and compares the types of innovation studied. The literature does not use its terms consistently; for example, the term "antecedent" and the term "factor" are used interchangeably and "factor" is used at all four of the classification levels identified. The classification system clarified the levels of the antecedents ("antecedent" will be used for the general term here).

There are challenges comparing antecedents of private/public/social and different types and stages of public sector innovation. (1) Different authors use different definitions of innovation and with regularity, provide no definition. (2) Private and public sectors often use different definitions of innovation and are concerned with different antecedents. (3) The term stages is used two different ways: as stages of adoption (e.g. Rogers' 5 stages) and as stages of the innovation process (e.g. readiness, negotiating approval, etc. (Glor, 1998). Moreover, sometimes trailblazing, adoption, dissemination and processes are all described generically as "innovation". Trailblazing (Glor, 2021a) is the first two (invention, early adoption) of Rogers (1995) five stages of adoption. The others are early majority, late majority, and laggard adoption. The literature identifies the antecedents of many types of innovation. (4) Introducing a classification system for the different levels of antecedent (unique antecedents, grouped antecedents, factors, clusters) introduces additional limitations that may not be discernable in the literature (Glor, 2021c). (5) Especially when they studied all types of public sector innovations,

authors typically introduced other kinds of limitations in their summaries of antecedents, making their research more manageable. De Vries, Tummers and Bekkers (2018), e.g. searched meta-analysis or review or systematic review or literature review or analysis but only reviewed three types of empirical literature on diffusion/adoption—public policy, public management and e-government innovations. (6) Researchers often limited their search of the literature to one field, such as public administration or education. (7) Authors limited what they searched in other ways, e.g. only the top-ranked print and electronic journals in each category (e.g. de Vries, Tummers and Bekkers, 2018). When Glor (2018a: 5-7, 16-19) searched the public sector innovation literature, s/he found that many more articles had been published in a non-top-ranked specialty innovation journal.[1] De Vries, Tummers and Bekkers (2018) did a meta-synthesis of articles on diffusion published in top-ranked journals by scholars in the past 25 years on the topic of diffusion. Glor (2021b) additionally included some practitioners (e.g. Innovation Network, 1999), earlier work (e.g. Mohr, 1969) and a broader range of journals. Including a wider/narrower range of authors, literature and time-frames may have made a difference to the antecedents of trailblazing and adoption found and may limit the comparability of the data. None of the publications included in SLRs and meta-analyses are fully comparable; rather, it is a question of whether comparison makes sense. Nothing can be done about the challenges at this point.

Damanpour has done the most work on private sector process antecedents, the LIPSE scholars and Walker on public sector process antecedents. The LIPSE scholars have done the most comprehensive work on antecedents of public sector and social antecedents, publishing three process reviews that included antecedents: two literature reviews and a SLR of antecedents of processes public and social innovation (Bekkers, Tummers, Stuijfzand and Voorberg, 2013; Bekkers, Tummers and Voorberg, 2013; de Vries, Bekkers and Tummers, 2016) and a meta-synthesis of policy, public management and e-government (de Vries, Tummers and Bekkers, 2018) that addressed eight antecedents. While the 2013 studies were exclusively on processes, the 2016 and 2018 studies included policy, process and outcomes literature. The 2013 and 2016 studies were on innovation diffusion. Were the antecedents and clusters (my/our terminology) identified of adoption/dissemination different from those of trailblazing (invention, early adoption)? Does reviewing a broader range of literature and authors matter? Ways authors identified clusters ("levels")? De Vries, Bekkers and Tummers (2016), e.g. in their review of antecedents of public sector innovation processes, considered the levels to be environmental, organizational, characteristics of the innovation and individuals. The focus was on internal issues so these levels could perhaps be considered our factors (a lower level) not clusters (Glor, 2021d). Most non-LIPSE authors, especially those considering policy (including program) dissemination (e.g. Berry and Berry, 2018), identified both external and internal clusters. Six factors explored in the instrument developed to explore five trailblazing programs and their five organizations in the Government of *hidden to maintain anonymity* (Glor, 2017a, b, 2018b; 2019) were external support, the economy, ideology, politics, resources and effects. These could also be divided into external and internal clusters, but the six factors were considered important and more explanatory. This article attempts to answer: "How do the antecedents and clusters identified for different types of innovation compare? Do a common set of factors and clusters influence all kinds of innovation or are antecedents unique to types of innovations?

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[1] Journals addressing specialty topics are not typically highly ranked, unless they address a large field such as education or health: smaller specialty topics attract fewer readers, those interested in the specific topic.

Types of Innovations

Some innovation typologies are already in use, distinguishing theories, type of innovation delivered (e.g. services), innovation implementation process stages, context and stages of innovation adoption. The term stage has been used to study two of the types (stages of the implementation process, adoption stages) but how the term stage was being used was sometimes seemed confused between them. Nomenclatures and classifications could be organized according to the types. The nomenclature and classification developed by Glor (2021c) considers theories, stage of adoption, and antecedent level but not type of innovation delivered or process stages.

Theories. In their meta-synthesis of diffusion and adoption, de Vries, Tummers and Bekkers (2018: Table 2) found the main theories and models referenced in the literature (January 1995 to August 2016) and applied to both the private and public sectors, were diffusion of innovations (Rogers, 1995) and neo-institutionalism (DiMaggio and Powell, 1983). The main public policy theory is diffusion, the main model proximity (Berry and Berry, 2014; Knill, 2005). The main publications referenced were, in order, Walker (1969), Rogers (various), Gray (1973), DiMaggio and Powell (1983), Berry and Berry (1990) and Dolowitz and Marsh (1996). Only one of them was published during the time period they reviewed. Burrell and Morgan (1979) and Gioia and Pitre (1990) used four theories to study organizations**:** interpretive, humanist, structuralist and functionalist. Interpretive theory considers case studies in depth and develops theories inductively from them. Humanist theory studies people; describes, critiques, and seeks to change. Structuralist theory identifies sources of domination and persuades in order to guide practices; it includes institutional theory. Functionalist theory searches for regularities, tests in order to predict, controls and maintains the status quo. Its theoretical interests are relationships, causation and generalization; theory-building occurs through causal analysis. Functionalism is typically used to study antecedents, presenting a problem for the study of antecedents of innovation, since functionalist theory does not encourage change. Glor (2014) used Burrell and Morgan's theories to create a conceptual framework for studying impacts of innovation on organizations, populations and communities (communities of practice [Brown and Duguid, 1991]). They have also been used as a framework for researching the impact of antecedents (Glor, 2014, 2018a).

Pollitt (2002: 481-2) divided organizational theories into functionalist and non-functionalist. Functionalist theories emphasize efficiency, environmental fit, focus on results and include institutional economics (principal agent including New Public Management [NPM] and property rights [privatization, corporatization, contracting-out, performance pay]) and contingency theories (logic of efficiency and adaptation to environments through learning). He called non-functionalist theory social constructivist or interpretive/hermeneutic, strongly shaped by a logic of appropriateness. Constructivist theories emphasize institutional path dependency, legitimacy, symbolism and fashion, and argue the evolution of organizations cannot be explained solely by functional factors or utility maximization. Interpretive theory analyzes phenomena. Circumstances (e.g. antecedents, using functionalist theory) and will (e.g. politics, motivation, using non-functionalist theory) are important (Glor 2002). Here Pollitt's types—functionalist and non-functionalist—are used. Structuralist and functionalist theories are treated as functionalist; interpretive and humanist theories are treated as non-functionalist. Non-functionalist approaches have explored social, political and historical antecedents; functionalist approaches have considered potential causes of innovation and often several innovations. Empirical literature

mostly studied diffusion in USA states (e.g. Berry and Berry, 1992) or among several governments (e.g. Glor, 1997), but studied a limited number of antecedents at a time. Interpretive and humanist literature often studied one/a few case studies and a few more antecedents (Glor, 2021c). Both approaches revealed the importance of antecedents. Their work isolated antecedents across many situations and theories and identified many antecedents. Theories were rarely discussed, however in the antecedent literature.

Type of service delivered. Some frameworks and definitions, though no protocols have been developed for SLRs in public sector innovation studies (e.g. Bloch, 2011; Bekkers, Tummers, Stuijfzand and Voorberg, 2013; Glor, 2014; Arundel, Bloch and Ferguson, 2019). The OECD/Eurostat's Oslo Manual 2018 claimed for the first time to include economic aspects of non-profit, public sector and individual household innovation (Gault, 2020). The Manual's focus is diffusion of innovation in a company or organization. Only empirical references were used in the Manual, all from the pilot OECD-sponsored Measuring Public Innovation in the Nordic Countries (MEPIN) project (Gault, 2018; Windrum, 2008; Bloch and Bugge, 2013). All use a taxonomy based on what the public sector delivers—service, service delivery, administrative and organizational, conceptual, policy, and systemic innovation (Windrum, 2008: 8). Basically, the original private sector definitions were extended to the other sectors, with the addition of policy. Standards have not yet been published.

Innovation implementation process stages literature has considered antecedents, often at the point when a decision to adopt is taken. Rogers (1995) described the innovation implementation process stages. Based on his, Glor (1998) described them as readiness, negotiating approval, effective implementation, focus on results, learning and organizational fate (Glor, 2011). The process stages approach fell out of favour with some policy scholars for a time; e. g, Sabatier (2007, 2014) criticized and dropped the 1999 chapter on process stages from future editions of *Theories of the Policy Process*. A process stages approach has recently been rejuvenated, however in somewhat different form, as part of the multiple streams and first and second order mechanisms approaches in policy studies (e.g. Capano and Howlett, 2020: chapters 3, 6, 8, 9).

Innovation adoption stages in a government. Reviews of antecedents of public sector innovation adoption have been done. Bekkers, Tummers, Stuijfzand and Voorberg (2013); Bekkers, Tummers and Voorberg (2013); and de Vries, Bekkers & Tummers (2016) reviewed antecedents of all stages of policy adoption—mostly diffusion but presumably also some trailblazing. A consistent group of "factors" influence social innovation (public sector, non-profit and for-profit sectors delivering social innovation): their highest level included innovation environment, the process and whether the innovation diffused.

Innovation adoption stages in a population/community also create a typology. Rogers' (1995) five stages of adoption apply. Glor (2021b) compressed them into trailblazing (invention, early adoption) and diffusion (early majority, late majority, laggards). This research developed a nomenclature and classification system for antecedents of trailblazing and adoption, based on those found in a SLR of trailblazing and adoption. Adoption publications identified their work as adoption and did not identify it specifically as diffusion/dissemination.

Antecedent levels. Innovation literature uses "antecedent" problematically by merging logical levels; e.g. Bloch & Bugge (2013) identified "lack of funding" and Mohr (1969) identified "strength of obstacles against" as antecedents but the first is more specific than the second, which is at a higher logical level. Merging different logical levels (levels of generality, nesting) means the antecedents identified in the literature cannot be compared directly. To remedy this problem, we organized unique antecedents into levels (Glor, 2021d).

This paper introduces the summary literature, outlines the methodology and research questions, identifies the antecedents outlined in the summary literature, responds to the research questions and compares the antecedents.

Methodology

This paper identifies and summarizes the antecedents identified in summary private and public process, policy, and trailiblazing/adoption/dissemination literature and compares the antecedents of different types of innovation. The paper considers four questions:
Q. 1: At what level should antecedents of innovation be analyzed and compared?
Q. 2: How do antecedents identified for different types of innovation compare—private, public and public-social sector?
Q. 3: How do clusters identified for different types of public sector innovation compare—trailblazing and adoption of policy; processes; dissemination; private, public, public-social sectors?
Q. 4: Do a common set of unique and grouped antecedents, factors and clusters influence all types of innovation or are there discernable differences?

Antecedents of Innovation Literature

Types of literature compared are not monothetic but polythetic and so not fully comparable; nonetheless, all studied a phenomenon they called innovation and its antecedents. It therefore has similarities in terminology and criteria (Glor (2021d). By compiling antecedents for different types of innovation, comparison is possible.

Private Sector. Damanpour's (1991: 555-6) meta-analysis of private sector empirical literature on adoption of innovations (generation, development, implementation) studied the antecedents/moderators/correlates and organizational properties that enhanced/hindered organizational innovativeness in private sector organizations. Innovation was something new to the adopting organization. Literature was found by searching *Sociological Abstracts*, 1960-88 and by using a snowball methodology (finding literature in other literature). Reviewing 23 empirical studies, he reported statistically significant antecedents. Four moderator categories were studied: type of innovation, stage of adoption, type of organization and scope of innovation. Manufacturing, service, not-for-profit and for-profit organizations were distinguished. He considered 13 determinants, mainly of structural but also of process, resource and organizational culture variables. He identified a statistically significant positive association between innovation

and nine determinants (specialization, functional differentiation, professionalism, managerial attitude toward change, technical knowledge resources, administrative intensity, slack resources, external and internal communication) and a negative association with centralization. He did not find significant associations with formalization, managerial tenure or vertical differentiation (p. 569). All antecedents were internal.

Public Sector. This paper considers literature reviews, SLRs and meta-syntheses of public sector innovation: processes (Walker, 2013; Bekkers, Tummers, Stuijfzand and Voorberg, 2013; Bekkers, Tummers and Voorberg, 2013; de Vries, Bekkers and Tummers, 2016; Cinar, Trott and Simms, 2019), and policy trailblazing/adoption (Glor, 2021c) and dissemination (de Vries, Bekkers and Tummers, 2016).

Process innovations. Several authors identified antecedents of the innovation process. *Walker (2013)* studied local governments, reviewing and integrating empirical evidence on external and internal antecedents. Process was defined as how an innovation is rendered. He reviewed 17 empirical articles, using the meta-analytic support score method, finding external cluster was not but political and internal clusters were important, especially political influence, organizational size, administrative capacity and organizational learning.

Bekkers, Tummers, Stuijfzand and Voorberg (2013) studied the social innovation process, including diffusion, constructing an integrative framework for successful social innovation and all the stages of the innovation process. Innovation is newness including learning, often a radical sense-making process, that reflects values and creates public value. Although they do not define the public sector as such, they define its types of innovation as product/service, technological, process, organizational/management, conceptual and governance (pp. 6-7, 11). While the paper is not a meta-analysis of the literature, it is a wide-ranging discussion of potential drivers of and barriers to the innovation process. Their Table 2 (pp. 32-3) listed three dimensions (here called clusters)—innovation environment, process and diffusion (adoption) (only the first two dimensions are of interest in this paper). They also listed sub-dimensions (here, factors) and drivers/barriers (Table 1). Their research identified potential drivers and barriers of successful social innovation in the public sector. They used the term adoption in two ways—as synonymous with implementation (Table 2: 10) and as diffusion (p. 10). While antecedents of implementation are important to both the trailblazing and adoption stages, and implementation is necessary to both, I/we prefer the term "implementation". The term adoption suggests a one-time decision and action while the terms diffusion and dissemination refer to many adoptions. We have learned that there is much more to successful implementation of innovation than a decision, although elected officials sometimes think so.

Bekkers, Tummers and Voorberg (2013) also published a literature review of public and social innovation drivers and barriers, but they identified the same determinants, factors and clusters as Bekkers, Tummers, Struijfzand and Voorberg (2013) on the social innovation process, so their focus was again on the process.

De Vries, Bekkers and Tummers (2016) reviewed 181 empirical studies on public sector innovation process published 1990 to 2014 (p. 146) on policy, process and outcomes literature.

Table 1: Grouped Antecedents Influencing the Innovation Process, Organized into Factors and Clusters

Dimensions (Clusters)	Sub-Dimensions (Factors)	Drivers/Barriers & Expected Influences Positive/Negative
Innovation Environment	Political & administrative triggers from within the public administration environment	-Political & administrative problems (+) -Multi-rationality of PA (+) -Introducing market-like competition (+) -Political competition for voters (+)
	Legal culture of the public sector	-Strong formalization & standardization (-) -Rule-driven "path dependencies" (-) -Innovations crossing legal jurisdictions (-)
	State, governance & civil service traditions	-Strong central & unitary state (-) -Decentralized structure with strong local/regional governments (+) -Market tradition (+) -Legalistic tradition (-) -Strong civil society (+)
Innovation Process	Linking administrative & political leadership	-Boundary spanning & scanning activities of leaders (+) -Connecting political realm with innovations (+) -Linking & balancing contradicting values (+) -Acting as an innovation champion (+)
	Support for & co-creation with end-users	-End-user perspective brings in new information, knowledge & experiences (weak ties) (+) -Performance & effort expectancy of end-users for the innovation (ease, salience, powerfulness & meaningfulness) (+/-) -Representativeness of involved end-users (+/-) -Compatibility with internal routines, procedures, systems & other grown practices (-)
	Risk management & Innovations	-Risk-avoidant political &/or administrative culture (-) -Short-term orientation of politicians (-) -Dominant performance management structures (-)
	ICT & social media	-ICT provided new capabilities & thus new ideas (+/-) -Degree of openness of ICT as an infrastructure (+)
Innovation Adoption/ Diffusion	Allocation of resources, characteristics of the organizations	-Slack (money, time, people) available (+) -Customer & learning orientation (+) -Professionalization of organization (+)
	Innovation champions & knowledge intermediaries	-Acting as an innovation champion (+) -Acting as a knowledge intermediary (+)
	Diffusion & adoption as a learning process	-Prizes & awards (+) -Codifying tacit knowledge (+) -Possibility of moulding innovation & visible outcomes (trialability, visibility) (+)
	Influence of looking-alike: isomorphism	Many organizations using an innovation, creating peer pressure to adopt (+)

N of antecedents not identified; 190 references. *Source:* Bekkers, Tummers, Stuijfzand and Voorberg (2013: 32-33, Table 2) (LIPSE)

This nicely covered NPM. The literature was qualitative (56%); quantitative (31% [p. 151]) and both (13%). The largest policy fields and government layers were local government (27%), central government (18%) and health care (14%). Few studies were conducted in the welfare (8%) and education (6%) sectors. The UK was most studied, especially the Labour government's public management reforms. Most articles did not define innovation (76%); even when defined, the definition was often general (24%); most were based on Rogers (1995)—an

idea, practice or object perceived as new by an individual or other unit of adoption. This is dissemination. The general definitions alluded to perceived novelty and first adoption by an organization. Only a few studies referred to discontinuity with the past. De Vries, Bekkers and Tummers (2016: 152) found this to be a substantial weakness because it eliminated the potential to distinguish innovation and incremental change (Table 2). They addressed several types of innovn: process-105, 47%; administrative process-89, 40%; technological process-16, 7% (total processes-210, 64.2%); product/service-49, 22%; governance-29, 13%; conceptual-4, 2%; and other-35, 16% (grand total-327, 100%). Policy consisted of governance and conceptual-33, 10.1%. They grouped the types of innovation into four: process (administrative and technological), new product or service, governance and conceptual. The largest category (40%) was administrative process innovations (mostly NPM), that they identified as a sub-set of process innovations, followed by new product or service (22%). Product or service innovation involved creation of new public services or products (Damanpour and Schneider, 2009). Governance innovation literature was mostly (65% of it) published after 2009 (Moore and Hartley, 2008). Antecedents were defined as influential in the innovation process (pp. 155 ff). De Vries, Bekkers and Tummers (2016) distinguished drivers and barriers and four main levels (p. 147, 149-50). They also distinguished antecedents of policy innovation (mainly governance innovations) and public management innovation trailblazing and diffusion. Public management innovations were defined as including all the innovation types. Antecedents of the innovation generation and adoption/dissemination stages were separated.

Table 2: Antecedents of Innovation Process De Vries, Bekkers and Tummers, 2016 (LIPSE)

Level			
Environmental	**Organizational**	**Innovation Characteristics**	**Individual**
Antecedents:			
Environmental pressures: media, political, public	Slack resources (time, $, ICT)	Ease in use	Employee autonomy (empowerment)
Participation in networks, inter-org'al relationships	Leadership styles	Relative advantage	Organizational position (tenure, mobility)
Regulations	Incentives/rewards	Compatibility	Job-related knowledge & skills (professionalism)
Compatible agencies/ orgs/ states adopting the same innovation	Degree of risk aversion/room for learning	Trialability	Creativity (risk-taking, solving of problems)
Competition with other orgs	Conflicts	Other e.g. cost, trust-worthiness, mouldability	Demographic aspects (age, gender)
Other	Org'al. structures		Commitment/satisfaction with job
	Other		Shared perspective & norms
			Innovation acceptance
			Other

Total N=181 (100%) – some studies included more than one type (p. 154). Org= organization.

Innovation generation was a process resulting in an outcome that is new to an organizational population (e.g. American municipalities with populations over 10,000 (Damanpour and Schneider, 2009: 504). Rogers' (1995) definition of adoption was used: "the voluntary or coercive process through which an organization passes from first knowledge of an

innovation, to forming an attitude towards an innovation, to a decision to adopt or reject, to implementation of the new idea, to confirmation of this decision." Damanpour and Schneider (2009: 497) defined adoption differently, as "a process that results in the assimilation of a product, process or practice that is new to the adopting organization." Both definitions identify innovation as new to the organization—organization was not defined.

Table 3: Antecedents of the Innovation Process, Organized as Grouped Antecedents, Factors, Clusters De Vries, Bekkers and Tummers (2016) (LIPSE)

Environmental Cluster	Org'al Cluster	Innovn. Characteristics	Individual Antecedents
Factor: Environmental pressures	*Factor:* Funding	*Factor:* Ease in use	*Factor:* Employee autonomy (empowerment)
Antecedents: media, political, public	*Antecedents:* Slack resources (time, $, ICT)	*Factor:* Relative advantage	*Factor:* Org. position
Factor: External Exposure	**Factor:** Management	*Factor:* Compatibility	*Antecedents:* tenure, mobility
Antecedents: Participation in networks, inter-org'al relationships	*Antecedents:* -Leadership styles -Degree of risk aversion/room - Incentives/rewards	*Factor:* Trialability	*Factor:* professionalism
Factor: Controls	*Factor*: Conflicts	*Factor:* Other	*Antecedents:* Job-related knowledge & skills
Antecedents: Regulations	*Factor:* Structures	*Antecedents:* e.g. cost, trustworthiness, mouldability	*Factor:* Creativity
Factor: Diffusion	*Antecedent:* Org. structures		*Antecedents:* risk-taking, solving of problems
Antecedents: Compatible agencies/orgs/states adopting the same innovn			*Factor:* Demographic aspects
Factor: Competition with other orgs			*Antecedents:* age, gender
			Factor: Commitment/ satisfaction with job
			Antecedents: Shared perspective & norms
			Factor: Innovation acceptance
Other	Other	Other	Other

De Vries, Bekkers and Tummers (2016) reviewed antecedents of the public sector innovation process in 73 articles on generation (their term)/adoption/ dissemination. They grouped the antecedents into four levels: environmental, organizational, characteristics of the innovation and individuals. Since the focus was process, which occurs internally and innovation characteristics referred to ease of implementation, these levels could be considered factors (Table 3). They classified antecedents related to "generation" of innovations as environmental, organizational and individual antecedents. Forty percent of the literature Antecedents of adoption/diffusion of innovations (40% of the literature) also included antecedents. Details of what was included in the categories were not provided but at a more general level, the categories

included are outlined in Table 2. Their four levels are reorganized into antecedents, factors (a higher level than antecedents) and clusters in Table 3.

In a SLR of 63 documents, *Cinar, Trott and Simms (2019)* found 65 barriers to public sector innovation processes; the main terms used were barrier and challenge. They investigated four dimensions: classification, interrelations, innovation process and types of innovations and used the following terms for barriers in their SLR of barriers to the innovation process: barrier (19 mentions), challenge (14), difficulty (7), problem (7), obstacle (6), impediment (4), hindering factor (3), hurdle (2), hampering factor (1) failure factor (1) and conflict (1), a total of 65 barrier antecedents. Finding barriers was more complex than recognized when emphasizing organizational barriers. They explored four questions: (1) What are the specific barriers within the PSI process and how can these barriers be classified? (2) How do the barriers differ between the key stages of the innovation process? (3) What are the interrelations between the various barriers? (4) How do the barriers within the process differ between technological and nontechnological innovations?

Table 4: SLR Grouped Antecedents, Ranked Factors within Clusters by Number and Percentage of Mentions in the Policy Innovation Trailblazing and Adoption Literature Glor, 2021b.

External Cluster, #, vertical %	Political Cluster, #, vertical %	Internal Cluster, #, vertical %
Governance environment/context-32 External Environment/Context-25 Institutions-17 Influence of other governments-6 External Context T-80 46.8%	Politics-24 Ideology-17 Political support-10 Drivers/demands-6 Drivers/demands T-57 47.9%	Innovation process-70 Structure-42 Policy/Process T-112 36.8%
Citizen pressure/role-50 Citizen Role T-50 29.2%	Political culture-28 (The) Political-6 Political context T-34 28.6%	Problem, Creativity, Ideas-50 Demand (push, drivers)-32 Enhance capacity to innovate-13 Drivers/Demands T-95 31.3%
National/state/innovation policy Innovation Policy/Process T-17 9.9%	Political Actors/People People T-22 18.5%	Other people-21 People only-16 People/Employees/Staff/Individual characteristics-3 People T-40, 13.2%
Drivers/Demands (push)/external support/good economy-13 Drivers/Demands T-13 7.6%	Political Barriers Political Barriers T-3 2.5%	Obstacles/Barriers (pull) Obstacles T-29 9.5%
Obstacles/Barriers (pull) Obstacles T-11 6.4%	Platform inclusive, included in political platform-3 Factor process for bldg. political platform T=3 2.5%	Organizational culture/climate-25 Internal only-3 Internal Environment T-28 9.2%
171 99.9% 8 grouped antecedents	*119* 100.0% 9 grouped antecedents	*304* 100.0% 10 grouped antecedents

Total antecedents=594. Unique antecedents=508. Grouped antecedents=27. Source: Glor, 2021d.
Notes: horizontal lines separate factors. T means total. * = five duplicates. No "other" category was needed.

Policy Innovation trailblazing/diffusion. Glor (2021b) did a SLR of 87 peer-reviewed documents on antecedents of public policy (including program) innovation trailblazing and

adoption, which presumably includes some trailblazing. Trailblazing is Rogers' (1995) first two stages of innovation adoption: invention/early adoption. Adoption is all five stages, diffusion the last three stages. The methodology for preparing the SLR is outlined in Glor (2021a). Data is quantitative, qualitative and expert opinion. Numerous antecedents were identified, a problem that Walker (2008) also recognized. Glor (2021d) created a hierarchical classification system from the antecedents: unique antecedents, grouped antecedents, factors, clusters. At the level of unique antecedents, they were not very similar but at each higher logical level they could be grouped. These groupings allowed classification, ranking and comparison (Glor, 2021c, d). Most-mentioned factors as a proportion of mentions in external cluster were context and citizen role; in political cluster drivers, context and people; in internal cluster innovation process, drivers and people. Most grouped antecedents were mentioned for internal cluster (304), second most for external cluster (171) and least mentioned for political cluster (119), a total of 594 (Table 4).

Lack of consistent definitions and mixing of types and levels in the innovation literature has hampered understanding of antecedents. While literature often distinguished external and internal clusters, it defined them differently. Berry and Berry (2018) included politics as part of their internal cluster (the jurisdiction) but the LIPSE scholars included politics in their external (innovation environment) cluster. Berry and Berry (2018) defined the terms internal and external differently than we do: they defined internal as internal to the jurisdiction while we define it as internal to the government and include political as a separate cluster because of its importance to policy. Our analysis is unique in separating and therefore paying more attention to the political cluster, which is particularly important to trailblazing of public policies. Because it is separate, it can be integrated with either external or internal clusters, if researchers wish.

Diffusion. The most comprehensive work on antecedents of public sector and social antecedents has been done by the LIPSE scholars, who published literature reviews, integrations of literature and meta-syntheses on diffusion. *De Vries, Tummers and Bekkers (2018)* did a meta-synthesis of 161 empirical publications addressing antecedents of policy, process and outcomes innovation diffusion/adoption as expressed in the public management, public policy and e-government literature, published January 1995 to August 2016. They found literatures were isolated from each other, had developed their own models and paradigms and had provided few definitions. Public management and policy scholars focused mainly on the macro-institutional environment, e-government scholars the individual level (p. 1). Seventy percent (70%) of articles failed to provide a definition of diffusion or adoption. Definitions of diffusion (or synonyms such as transfer) were almost exclusively found in the public policy literature (e.g., Jordan and Huitema, 2014a, b; Knill, 2005), and often built on Rogers' (1995: 11) definition of innovation as an idea, practice or object perceived as new by an individual or other unit of adoption. A definition of adoption was also only provided on a few occasions, described for instance as "the acceptance and incorporation of… applications into everyday practice" (Cresswell and Sheikh 2013: 74). They found that the terms diffusion and adoption were used interchangeably.

Non-LIPSE authors, especially those considering policy and program dissemination (e.g. Berry and Berry, 1990), focused on external clusters; e.g. Berry and Berry (2018) explored regional and national influences on adoption of policy innovations. The six factors explored in the trailblazing instrument for five trailblazing programs in the Government of *hidden to*

maintain anonymity (Glor, 2017a, b, 2018b; 2019) were external support, the economy, ideology, politics, resources and effects. Although these could be divided into external and internal clusters, the six factors were considered important and more explanatory. Akenroye's (2012) literature review of factors influencing/driving innovation in the health sector (National Health Service [NHS], UK) included innovation models and drivers of innovations in organizations. Secondary data were collected from NHS publications on healthcare innovation. He identified four types of changes driving public sector innovation—customer changes (citizens' demands, patients' needs), technologies, nature of competition and operating environment. Forces driving innovation were persistent problems with no known pathways to solution, long term and pressing challenges, increasing demand on public services and recession leading to tightening of public finances.

Comparison. Using antecedents found in reviews of private and public innovation process, policy and dissemination literature, comparisons are conducted. The most reviews of public sector innovation have been conducted on processes. The antecedents of policy innovation trailblazing stage is compared to all adoption stages (Rogers, 1995; Glor, 2021c) and then compared to a LIPSE review of dissemination antecedents. The questions are answered.

Findings

This section responds to the questions.

Q. 1: At what level should antecedents of innovation be analyzed and compared?
One reason this is important is that classification would facilitate comparison among innovations, situations and types of studies of innovation antecedents. How to compare antecedents is a practical question and a new subject. A terminology and classification system have been identified (Glor, 2021d), so this question can now be considered. Two issues need to be considered.

First, in developing a taxonomy of antecedents of information systems success, Larsen (2003) concluded that variables (antecedents) only exist at the lowest level of classification, the other levels are concepts; concepts no longer have operationalizations connected to them. The classification level at which antecedents should be considered is the one that allows comparison. Second, many antecedents have been identified: while most studies focused on a few antecedents, the LIPSE and trailblazing studies identified many. Comparison also cannot not be done at the level of antecedents because there are so many; hence we/I did comparisons within our study at the level of factors and clusters; e.g. drivers/demands/push, ideology, politics, demand are grouped antecedents; classified as drivers, a factor. Names of the factors must be so vague, however, that they contribute little to understanding trailblazing of innovation (e.g. "drivers"). A thorough understanding would require that individual antecedents be explored. Glor did so in analyzing a SLR of antecedents of trailblazing and adoption; antecedents can be analyzed at the antecedents and grouped antecedent levels within studies. Based on the literature reviewed in the current paper, however they could only be compared across studies at the cluster level. To answer Q. 1: Antecedents should be compared at the least general level possible, that is, at the level

where data is available for all sources. Likewise, data and concepts must be chosen at the appropriate levels for specific analyses; here, the level of clusters was chosen.

Table 5: Comparison of Factors Identified in Private, Public Sector and Public-Social Innovation Literatures

Type of Literature	Type of Lit	Antecedents/Factors
Private Sector Process Innovation	***Damanpour***, 1991 Meta-analysis of empirical literature Damanpour & Wischnevsky 2006	***Adoption of innovations*** (generation, development, implementation). ***Definition of innovation***: New to the adopting organization. Searched *Sociological Abstracts* 1960-88 and used snowball methodology. 23 empirical studies, 21 articles, 2 books. *Statistically significant:* Positive association: specialization, functional differentiation, professionalism, managerial attitude toward change, technical knowledge resources, administrative intensity, slack resources, external & internal communication Negative association: centralization. *Not significant*: formalization, managerial tenure, vertical differentiation Organizational context (size, age), innovation characteristics (radicalness, source), measurement of innovation (speed, magnitude)
Public Sector *Process Innovation*	Local governments *Walker* 2013 Meta-analytic support score of empirical journal articles.	***Adoption*** of innovations (generation, development, implementation) in organizations. ***Innovation*** is something new to the adopting organization. ***Process innovations*** are concerned with how services are rendered, including organizational and technological components of organizations, together with inter-organizational relationships. Recent changes in the management of public organizations have heightened the importance of internal organizational changes, including NPM, which placed an emphasis on process innovation through its focus on business and managerial practices and networked governance. p. 2. Included ***17 articles***, some private sector. ***Method***: Meta-analytic support score: combined and synthesised the results of the empirical evidence, based on the percentage of statistical tests that support the hypothesis that internal and external antecedents, positively or negatively, influence innovation adoption. p. 9. ***Antecedents:*** Organizational size, administrative capacity, organizational learning important. External antecedents not important.
	Social Innovation Processes ***LIPSE scholars:*** *-Literature reviews:* Bekkers, Tummers, Stuijfzand & Voorberg, 2013; Bekkers, Tummers & Voorberg, 2013 *-SLR:* de Vries, Bekkers & Tummers, 2016	Antecedents of innovation generation & adoption/dissemination. Stages separated. *Innovation generation* is a process resulting in an outcome that is new to an *organizational population*. ***Antecedents:*** *External*: PSE legal culture; state, governance & civil service traditions; external context (e.g. political mandates); administrative triggers; resources; actors; drivers & barriers; complex interactions between intra-organizational & environmental antecedents (porous boundaries) *Internal:* Traditions, administrative triggers, internal media, risk management, relationships with outside
	Cinar, Trott and Simms, 2019 Systematic review of barriers to PSI	***Innovation*** is "a process through which new ideas, objects and practices are created, developed or reinvented, and which are new for the unit of adoption" (Walker, Avellaneda, and Berry, 2011). They do not approach the concepts of innovation or barriers in a normative positive way. ***Data***: literature from ***63 empirical articles*** on barriers within PSI *processes*, 4 dimensions: (1) classification; (2) interrelations; (3) innovation process; (4) types of innovations.
Public Sector Policy Innovation	Policy Trailblazing & adoption: *SLR* Glor, 2021 I-V	***Definition of trailblazing***: Invention plus first two adoptions in a community or population community/population. External cluster-171 Political cluster-119 Internal cluster-304 Total -594 antecedents, 508 unique

Type of Literature	Type of Lit	Antecedents/Factors
Public-Social Innovation Diffusion	*LIPSE* scholars:	***Public & Social innovation, mostly diffusion***: ***Innovation diffusion*** is "the process in which an innovation is communicated through certain channels over time among the members of a social system". Adopting an innovation is "the process through which an individual (or other decision-making unit) passes from first knowledge of an innovation, to the formation of an attitude toward the innovation, to a decision to adopt or reject, to implementation and use of the new idea, and to confirmation of this decision" (Rogers 2003, p. 20). We call this the innovation process.
	-SLR: Voorberg, Bekkers & Tummers, 2015 *Cocreation/ co-production*	122 studies (1987–2013) of cocreation/co-production with citizens, analyzzing (a) objectives of co-creation and co-production, (b) their influential factors, (c) outcomes of cocreation and co-production processes. *Organizational side:* -Compatibility of public organizations with citizen participation 47 (46%) -Open attitude towards citizen participation 23 (22%) -Risk-averse administrative culture 19 (18%) -Presence of clear incentives for co-creation (win/win situation) 14 (14%) Total 103 (100%) *Citizen side:* -Citizen characteristics (skills/intrinsic values/marital status/family composition/level of education) 10 (33%) -Customer awareness/feeling of ownership/being part of something 9 (30%) -Presence of social capital 9 (30%) -Risk aversion by customers/patients/citizens 2 (7%) Total 30 (100%)

	-Meta-synthesis: de Vries, Tummers & Bekkers, 2018 *Diffusion & adoption*	***Antecedent Levels (Clusters) & Factors:***
		 Environment:
		 -Legal culture of the public sector
		 -State, governance & civil service traditions
		 -Social, political, administrative triggers
		 -Quality of relationships within networks, resources
		  Process:
		  -Linking administrative & political leadership
		  -Support for & co-creation with end-users
		  -Risk management
		  -ICT, social media
		 Innovation Diffusion:
		 -Allocation of resources, characteristics of organizations
		 -Innovation champions & knowledge intermediaries
		 -Diffusion & adoption as a learning process
		 -Isomorphism

Q. 2: How do the antecedents identified for different types of innovation compare—private, public and public-social sector?

Literature reviews, SLRs and Meta-analyses of the antecedents of innovation in the private, public and social sectors have been conducted (Table 5). The meta-analyses reviewed address private sector adoption of innovations (generation, development, implementation) and public sector adoption, processes and dissemination or all stages. Public sector innovation is also defined as social innovation by the LIPSE scholars. They describe it as a vague concept that is also inspiring (Bekkers, Tummers, Stuijfzand and Voorberg, 2013: 2).

Factors mentioned for innovation in the private and public sectors for processes and trailblazing/adoption/dissemination in the public sector are summarized in Table 5. Considering a wide range of literature identified many antecedents, but the factors and especially the clusters

are somewhat similar to those examined for the public sector by the LIPSE scholars and others. While policy and process literature included external antecedents, they are different for private and public process innovations, which focused on internal factors. To answer Q. 2: The antecedents of different types of innovation have similarities and differences.

Table 6: Antecedent Clusters of Different Types of Innovation

Cluster	Process		Policy
	Private Sector	Public Sector	Public Sector
	*Private Sector**	*Summary 5 Public Process Studies***	*Summary Policy LIPSE scholars****
External	Industry/sector	-PSE legal culture -State, governance & civil service traditions -External context (e.g. political mandates) -Admin triggers -Resources -Actors -Drivers & barriers -Complex interactions between intra-org'al & environmental antecedents (porous boundaries)	-External context 46.8% -Legal culture -State & governance tradition -Social triggers -Quality of relationships within networks >10%: External context, citizen role, collaboration, coercion, learning in networks, competition. -Mimicry -Proximity
Political	None	None	-119 antecedents, 20.0%, -9 grouped antecedents -Political triggers -Political drivers 47.9% -Political context 28.6% -People 18.% = 95% of 100% Political mandates
Internal	Specialization Functional differentiation Professionalism Managerial attitude to change Technological knowledge Admin've intensity Slack External & internal communication	-Traditions -Linking admin've & political leadership -Support for & co-creation with end-users -Triggers -Resources -Internal media/ICT, social media -Risk mgmt. -Intra-organizational antecedents -Org'al: structural & cultural features of an orgn e.g. org'al slack resources -Innovation level: intrinsic attributes e.g. complexity -Employee level: characteristics of innovators e.g. empowerment. -Relationships with outside -Barriers -Classification -Innovation process -Types of innovations	-Innovation process -Drivers -People -Slack resources -Supportive leadership -Support for co-creation with end-users -Risk culture/management -Size of organization -Organizational structure

* Damanpour 1991
** Walker, 2013 (organizational size, administrative capacity and organizational learning); Bekkers Tummers Stuijfzand Voorberg, 2013 (190 references, 1 external cluster, 6 internal factors); Bekkers, Tummers Voorberg, 2013 (N = 17 antecedents; drivers & barriers relating to innovn environment, innovn process, adoption)' De Vries Bekkers Tummers 2016 (181 empirical articles/books on the PSI process, published 1990 – 2014, 4 types of innovn, 222 studies of innovation; Cinar, Trott and Simms, 2019 (63 empirical articles on barriers within PSI processes).
*** Glor (2021bII) on policy/adoption (N= 87 publications 1965-2020, 594 antecedents); De Vries Tummers Bekkers 2018 on diffusion/adoption PSE innovations in 3 fields: social policy, public management. [policy & processes], e-govt, included policy diffusion, policy convergence, policy transfer (73 publications Jan 1995 to August 2016).

Q. 3: How do clusters identified for different types of public sector innovation compare— trailblazing and adoption of policy; processes; dissemination; private, public, public-social sectors?

Table 6 summarizes and compares the antecedents and clusters of the private and public process, trailblazing, adoption and dissemination literature. LIPSE authors grouped antecedents into external and internal clusters and whether the innovation disseminated. Glor (2021b) clustered grouped antecedents and factors into 171 external, 119 political and 304 internal antecedents and, since their research is on trailblazing (invention, early adopters), did not address and did not know whether innovations disseminated; however, they included research on adoption that allowed comparison between trailblazing and adoption (all 5 stages)/diffusion.

External cluster antecedents were notable for public sector trailblazing and adoption. Only one antecedent was mentioned in external cluster for private process innovations. Glor's (2021b) analysis separated and paid more attention to the political cluster. The literature suggested trailblazing had an important political component. A few political factors were mentioned for dissemination, process and all adoption literature, none were mentioned for other innovation. Glor's (2021b) research found antecedents and factors in the external cluster were mentioned 171 times with regard to trailblazing of innovations, in the political cluster 119 times and in the internal cluster 304 times. The literature on trailblazing found and explored more antecedents than the literature on processes and diffusion. For all clusters studies, more internal cluster antecedents were mentioned than others. Glor identified more antecedents which public servants could control, at least partially (internal cluster), than ones beyond their control (external, political cluster). To answer Q. 3: The different types of innovation shared an interest in internal cluster but trailblazing showed more interest in external and political cluster than the other types of innovation.

Q. 4: Do a common set of unique and grouped antecedents, factors and clusters influence all types of innovation equally or are their antecedents discernably different?

Private and public sectors can mostly be compared at the internal cluster level. Table 6 summarizes and compares the antecedents and clusters highlighted in their literatures. External cluster antecedents played more of a role in the public literature than the private sector literature. Political antecedents were only mentioned in the public sector policy and dissemination literature. Internal cluster was the most important in both private and public sector literatures. The internal antecedents identified varied somewhat by type of innovation and cluster. Not surprisingly, internal cluster was most important for all of the process studies but surprisingly, also for the policy and dissemination studies. Trailblazing and adoption had similar portions of external antecedents but different ones of political and internal antecedents.

There were similarities and differences between the policy, trailblazing, and adoption and trailblazing and adoption/diffusion antecedents. When trailblazing/adoption and dissemination studies were compared, the external and internal clusters were mentioned most in the trailblazing/adoption study (Table 7), the only study to have a third category. Even when a wider range of studies was considered (including non-empirical, a larger time frame, non-top ranked journals, internal cluster continues to be dominant in innovation literature. The importance of external cluster in the Glor (2021b, d) and De Vries, Tummers & Bekkers (2018) studies was discernably different from the private and public process studies. Trailblazing (43.5% internal)

was discernably different from the adoption (53.3% internal) studies but not from dissemination (40.6% internal) studies. Combined, trailblazing and adoption are similar to dissemination and can be compared.

Table 7: Comparison of Trailblazing/Adoption and Diffusion/Adoption Antecedents

Author	Topic	External	Political	External + Political	Internal	Total
Glor, 2021bII	Trailblazing	36 27.5%	38 29.0%	74 56.5%	57* 43.5%	131 100.0%
	Adoption	135 29.2%	81 17.5%	216 46.7%	247* 53.3%	463 100.0%
	Trailblazing + Adoption	171 28.8%	119 20.0%	290 48.8%	304* 51.2%	594 100.0%
De Vries, Tummers & Bekkers' (2018)	Dissemination of PSE innovn.: public mgmt., public policy, e-govt	161* 59.4%	N/A	161 59.4%	110 40.6%	271 100%

* Largest number. *Sources:* Glor, 2021b; De Vries, Tummers and Bekkers', 2018.

Comparisons. This review has revealed a substantial number of reviews of innovation. Most of them were done by the LIPSE scholars, but they offered essentially the same antecedents for all of the studies. It revealed only one SLR of policy. If adoption is treated as the same thing as dissemination, more studies of policy are needed.

Conclusion

This article compared literature reviews, SLRs and meta-analyses of or that included antecedents of (1) private sector and public sector innovation; (2) public sector process, policy and diffusion literature; and (3) public policy trailblazing and adoption; adoption and dissemination studies.

The overviews of grouped antecedents, factors and clusters were different in the private and public sectors. In the private sector, the only important external cluster element was external industry/sector; the political cluster was not important; the internal was the important cluster. For the public sector all three clusters were important: external, political and internal, except for process innovations, where political cluster was not important. The external cluster was important for trailblazing, adoption and diffusion and in public/social sector innovations. It was not important for process innovations. The political cluster was only important for public sector trailblazing and diffusion. The internal cluster was important for all innovations (Table 7).

Kimberly and Evanisko (1981) defined antecedents (variables) as contextual, organizational and individual while the LIPSE scholars defined them as variations on innovation environment, process and whether innovations diffused, although de Vries, Bekkers and Tummers (2016) also used "individual". Kimberly and Evanisko found these three variables (factors) were much better predictors of hospital adoption of technological innovations than of administrative innovations. Technological and administrative adoptions were influenced by a variety of variables (antecedents) but organizational level antecedents, especially size were the best predictors of both. Researchers have tended to focus on a single innovation or a single class

of innovations, making generalization difficult. Many, even most, studies are single cases/a small number of cases. This paper contributed to exploration of Kimberly and Evanisko's (689-90) questions: (a) Which variables within the classes have the most influence? (b) Do different variables have different explanatory roles depending on the type of innovation at question? Glor (2021b) had more evidence because she knew number and percentage of mentions. Systematic quantitative comparative analysis of adoption behaviour requires larger samples than one/a few cases. (c) Which grouped antecedents, factors, clusters were most important in explaining variability? (d) What is the relative explanatory power of each cluster? (d) Does the relative explanatory power of the clusters (classes) depend on the type of innovation being examined? Although we came at our questions about variables somewhat differently than Kimberly and Evanisko, we provided answers to both our and their questions.

These findings support the suggestion that the public sector is more complex than the private sector and that innovation in the public sector is a more complex phenomenon. For the internal cluster, the private sector literature lists more antecedents than factors as influencing innovation. The public sector literature identifies more antecedents than the private sector literature. The reasons for this are not given, but perhaps public sector scholars and managers (whom public sector scholars mostly consult) think more conceptually and face too complex an environment to pick out specific antecedents. The 594 antecedents foreshadowing trailblazing suggest antecedents cannot be studied individually but must be grouped into categories.

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