Conclusion: Important Antecedents of Public Policy Innovation as Revealed in a Systematic Literature Review – VI

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ABSTRACT

A systematic literature review (SLR) of antecedents of trailblazing and adoption of public policy innovation was conducted. Many antecedents were found—594. A terminology and classification system for them was therefore developed (unique antecedents-508, grouped antecedents-28, factors-15, clusters-3). Differences among trailblazing/adoption and quantitative/qualitative studies were explored six ways. Eleven grouped antecedents of trailblazing were importantly different from those of adoption, 17 were not. Grouped antecedents of quantitative and qualitative studies were not importantly different and so were used as the standard. Only trailblazing had different antecedents from the other three types of study (adoption, quantitative, qualitative). Eight grouped antecedents were the best indicators of policy innovation. Of the three clusters of antecedents, external and internal cluster grouped antecedents were equally important for all four kinds of study; political cluster antecedents were different for trailblazing. Although there was no one best political indicator (large difference from adoption) for trailblazing, political cluster was more important for trailblazing than adoption. Political cluster was higher (had a higher proportion of mentions) and internal cluster lower for trailblazing; political cluster was lower and internal cluster higher for adoption. The important antecedents for public policy innovation were compared to those for the private/public sector, public process/policy and public/social innovation: Differences were found. The best antecedent indicators of trailblazing of policy innovation identified in the literature were external environment, drivers, obstacles (external) and people (internal).

Key words: antecedents, public policy, public sector innovation, trailblazing, adoption

Introduction

This paper attempts to identify the important antecedents of public policy innovation, based on the findings of a systematic literature review (SLR) of antecedents of policy innovation. *Innovations* are new policies adopted the first three times by governments in their community/population. A government's *population* is a group of related governments, such as all USA state governments or all progressive/conservative governments. A *community* is the group of governments or people to which the government or people compare themselves and/or with which they work with regard to the issue under consideration, e.g. a community of practice. Because large comparison groups are involved, innovativeness is identified.

The five earlier papers in this issue of *The Innovation Journal: The Public Sector Innovation Journal (TIJ)*, 26(2) 2021 developed and explored the findings of a SLR of antecedents of trailblazing and adoption of public policy innovation. This paper summarizes and positions the findings for trailblazing/adoption and quantitative/qualitative studies. Trailblazing is Rogers' (1995: 257-280) first two of five adoption stages in a government population/ community ("system"); adoption is all five stages. His five adoption stages are innovation (invention), early adoption, early majority, late majority and laggard adoption. The SLR only considered public policy innovation, not process (administrative) innovation.

Table 1: Grouped Antecedents, Factors and Clusters Derived from a SLR of Antecedents of Trailblazing and Adoption of Public Policy Innovation

Factors	**Clusters**			**Total # mentions, %**
	External No. & % of Grpd Antecedents	**Political No. & % of Grpd Antecedents**	**Internal No. & % of Grpd Antecedents**	**No. & % of Grouped Antecedents**
Context	Governance environment/ context-32 External environment/ context-25 Institutions-17 Influence of other governments-6	Political culture-28 (The) Political-6	Organizational culture/climate-25 Internal only-3	142 23.9%
Across	Factor external context T=80, 56.3%	Factor political context T=34, 28.6%	Factor internal context T=28, 9.2%	99.9%
Drivers	Demands/push/ drivers//external support/good economy-13	Politics-24 Ideology-17 Political Support-10 Drivers/demands-6	Problem, creativity, ideas-50 Demand/drivers/push-32 Enhance capacity to innovate-13	165 27.8%
Across	Factor drivers T=13, 7.9%	Factor political drivers/ demands T=57, 47.9%	Factor drivers T=95, 31.3%	100.0%
Obstacles	Barriers/obstacles/pull-11	Political barriers/obstacles-3	Barriers/pull/obstacles-29 \	43 7.2%
Across	Factor obstacles T=11, 25.6%	Factor obstacles T=3, 2.5%	Factor obstacles T=29, 9.5%	100.0%
Policy/ Process	National/state innovation policy-17	Platform developed in inclusive manner; included in political platform-3	Innovation Process-70 Structure-42	132 22.2%
Across	Factor innovation policy T=17, 12.9%	Factor process for bldg. political platform T=3, 2.5%	Factor process T=112, 36.8%	100.0%
People	Citizen pressure-50, 29.2%	Political Actors/People-22	Other people-21 People only-16 People/employees/staff/ individual characteristics-3	112 18.9%
Across	Factor people T=50, 44.6%	Factor people T=22, 18.5%	Factor people T=40, 13.2%,	99.9%
Other	0	0	0	0
Total ant	171	119	304	594
Vertical	100.1%	100.0%	100.0%	100.1%
Across	28.8%	20.0%	51.2%	100.0
No. Grpd Ant	8	9	11	28

Notes: Horizontal lines separate the factors; T=total; antecedents include 5 duplicates (listed in more than one cluster); some percentages add to more than 100, due to rounding. *Abbreviations:* Ant=antecedents, No./#=number, Grped=grouped, %=percent, Bldg=building. *Source*: Paper II, Table 1, p. 14.

The literature did not give a clear view nor identify a limited number of antecedents that most influenced trailblazing and adoption. Rather, the SLR identified 508 unique antecedents, an incoherent picture. This issue of TIJ and this paper try to improve clarity. Some of the terms used in the literature came from the private sector management literature, such as the terms cost, human resources development, organizational culture, and government policy (Mohen and Roller, 2005; Baldwin and Lin, 2002).

To create a clearer and more precise picture, a terminology and classification system for antecedents of trailblazing and adoption of public policy innovation were developed from the SLR. More consistency was thereby brought to the terms used for the antecedents. Antecedents were not very similar, but they were analyzed into 508 unique antecedents, 28 grouped antecedents, 15 factors and 3 clusters (Table 1). Only one fifth (86) of antecedents were duplicates, that is, referred to the same or similar phenomena.

Paper I outlined the methodology used and the SLR process. Paper II identified and analyzed the data accumulated in the SLR for trailblazing and adoption. Paper III developed the terminology and classification system (levels) for the data. Paper IV compared the antecedents of trailblazing/adoption to quantitative/qualitative studies. Quantitative/qualitative studies were used as the comparison group as their results were similar to each other. Trailblazing studies compared to adoption studies were less similar. Paper V identified and compared the important grouped antecedents identified for trailblazing and adoption to other literature reviews, SLRs and metaanalyses of antecedents of other types of innovation—process/policy in private/public/social sectors. This Paper VI summarizes the results from the other papers, identifies the best indicator antecedents based on differences in the number of mentions in the SLR, compares the data to other innovation literature and considers the implications for policy innovation.

Methodology

A SLR of antecedents of public policy innovation was conducted, guided by the Preferred Reporting Items for Systematic Reviews and Metaanalyses (PRISMA) protocol (Moher et al, 2009), developed for medical studies and considered a gold standard. Its process and protocol were found to be applicable to this SLR. A flow diagram of the SLR process was prepared in Paper I. 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. The question was "What does the literature say are the antecedents influencing trailblazing and adoption of public policy innovation?" Statistical methods (meta-analysis) may or may not be used to analyze and summarize the results of the studies. *Meta-analysis* refers to the use of statistical techniques in a systematic review to integrate the results of included studies" (Moher et al, 2009: 1).

Only papers indicating they were studying adoption were included as adoption. A few papers distinguished adoption and dissemination. Likewise, only a few papers distinguished the five stages of adoption (Rogers, 1995); numerous publications did not define innovation or adoption. When Rogers' invention/early adoption was identified, the literature was included as

trailblazing (defined as first, second and third adoptions). When trailblazing and adoption were addressed as one phenomenon, the paper was included as adoption.

The literature used the term "antecedent" for more than one logical level; e.g. Bloch and Bugge (2013) identified "lack of funding" as an antecedent while Mohr (1969) identified "strength of obstacles against," as an antecedent. While these could refer to the same thing, they are at different logical levels (levels of generality), so they cannot be compared directly. Paper III remedied this problem by developing a nomenclature and classification system for trailblazing and adoption; it treats "lack of funding" as an antecedent, barriers/obstacles/pull as a grouped antecedent and obstacles as a factor.

Paper II organized and summarized the antecedents that researchers and practitioners had identified as occurring prior to implementation of trailblazing and adoption of public policy (including program) innovation. Because trailblazing occurs at one point in time and is affected by the antecedent variables, antecedents are of interest. An *antecedent* is a phenomenon occurring before an innovation is implemented, that might influence whether it is implemented. Antecedents may influence every stage of innovation adoption (Author(s), 1998: 330). Antecedents are the *variables* being studied in this issue of *TIJ*. The term antecedent is used synonymously with variable/determinant/moderator/influence.

Groupings of antecedents are antecedents related by categories of terminology. *Factors* are related groupings of groups of antecedents. *Cluster*s are related groups of factors (levels)—there are only three of them. Each level is more general. Limited research has been published that explicitly examines levels, with the exception of De Vries, Bekkers and Tummers (2016) and Author(s) (2018, 2019). Organizing groups of antecedents into factors and the even more general category of clusters (Author(s), 2019) allowed groupings to be more comparable.

The literature's lack of consistent definitions and mixing of levels and stages as adoption and dissemination hampered understanding of antecedents and placed limitations on their study. The literature sometimes distinguished external and internal cluster; the current analysis also identifies a political cluster, found to be especially important to trailblazing of public policy innovation. Several early policy innovation studies focused on which governments introduced policy innovations first or early (e.g. Cutright, 1965; Poel, 1976; Author(s), 1997) but others (e.g. Mohr, 1969) and more recent studies (e.g., Colvin, 2006) have focused on dissemination of policy but included first trailblazers. Most innovation literature since has been about dissemination, which includes all of Rogers' stages but does not distinguish them. Its concern is whether an innovation has been adopted (yes/no) across governments, not its order of adoption.

Findings and Analysis

The SLR identified 87 relevant documents, 21 on trailblazing and 66 on adoption. The most-mentioned grouped antecedents were citizen pressure, innovation process, internal structure and political culture. The most-mentioned individual factors were internal process (112 grouped

antecedents), internal drivers (95), external context (80), political drivers/demands (57) and external people (50). The factors applied to all clusters—they were drivers (165), context (142), policy/process (132), people (112) and obstacles (43). They were organized into clusters—external (171), political (119) and internal (304) (Table 1). The most-mentioned factors in external cluster were external context, people (citizen pressure) and obstacles; in political cluster, drivers/demands, political context and political actors; in internal cluster, the innovation process, drivers and people. Grouped antecedents were identified twice as often for internal cluster than for political and more often for external cluster. Based on number of mentions the literature considered the internal cluster to be the most important. Considered as proportions of clusters, the results are different (Table 1, 2).

Innovations can be classified a number of ways, based on theories (e.g. functional), types of innovation delivered (e.g. services), stages of the innovation implementation process (e.g. approval, implementation), context (e.g. large/small organization, good/poor economy, ideology) and stages of innovation adoption (e.g. invention, early adoption). The *Oslo Manual* (OECD/ Eurostat, 2018) uses what is delivered and whether it has been adopted; our classification system is based on order of adoption and permits identification of innovativeness. The classification methodology employed created a terminology and rules of classification, developed consistent groups and categorized the antecedents into levels. A *polythetic system* was chosen, where classification levels have many but not all properties in common (Author, forthcoming III).

The antecedents of trailblazing/adoption and quantitative/qualitative studies were compared in Paper IV. In 21 trailblazing studies, 131 antecedents were identified, a mean of 6.2 antecedents per document: 57 internal grouped antecedents, 38 political and 36 external. The most important (most mentioned) antecedents were internal. In 66 adoption studies, 463 antecedents were identified, 7.0 per document, 12.9 percent more. In adoption studies, internal grouped antecedents (247) were also mentioned most, followed by 135 external and 81 political. In the combined study (trailblazing/adoption), internal cluster (304 grouped antecedents) is relevant to the internal operations of government (e.g. legislatures, cabinets, internal operations); political (119) to the political domain (e.g. political parties) outside government; external (171) to the environment outside both the government and the political domain.

The proportions of grouped antecedents found in trailblazing and adoption were different, defined as =>7% difference within its cluster. Of 28 trailblazing and adoption grouped antecedents, 10 were similar (<7% difference), 35.7%; 18 were different, 64.3% (=>7% difference) (Table 2). External and political clusters had the most differences, internal cluster fewest. Grouped antecedents of trailblazing and adoption were not the same.

In quantitative and qualitative studies, 37 quantitative studies had 248 antecedents, mean of 6.7 antecedents per study and in 50 qualitative studies, 346 antecedents, mean of 6.9 per study were found. This is a difference in the mean number of antecedents per study of 3.0%, so they are similar means. In quantitative literature, 122 internal antecedents, 76 external and 50 political were identified. In qualitative literature, 182 internal, 95 external and 69 political antecedents were identified. Most grouped antecedents of quantitative and qualitative studies were similar (<7%

different) (16, 57.1%), fewer were different (=>7% different) (12, 42.8%). Grouped antecedents of trailblazing and adoption studies were more different than those of quantitative and qualitative studies, which were more similar. Antecedents of quantitative/ qualitative studies were relatively similar, so they were used as a comparison group for trailblazing/adoption.

Table 2: Differences of Percentages of Grouped Antecedents, Proportion of Clusters for Trailblazing/Adoption and Quantitative/Qualitative Data; Differences of Differences

Types of Grouped Antecedents (Vertical Measures):	**Trail-blazing %**	**Adop-tion %**	**Differ-ence***	**Quant. %**	**Qual. %**	**Dif****	**Dif. Bet. Col. 4 & Col. 7*****
External Cluster:							
External Context %	30.6	10.4	***+20.2***	18.4	11.6	***+6.8***	**13.4**
Institutional context %	2.8	11.9	***-9.1***	7.9	11.6	***-3.7***	**5.4**
Governance Environment %	2.8	23.0	***-20.2***	11.8	24.2	***-12.4***	**7.8**
Citizen pressure/role %	22.8	31.1	***-8.3***	22.4	34.7	***-12.3***	**4.0**
Policy % Vertical	0	12.6	***-12.6***	13.2	7.4	***+5.8***	**6.8**
Drivers/Demands (push)/external support/good economy) %	19.4	4.4	***+15.0***	10.5	5.3	***+5.2***	**9.8**
Obstacles/Barriers (Inventory low/Pull) %	11.1	5.2	***+5.9***	7.9	5.3	***+2.6***	**3.3**
Influence of other governments/regions %	11.1	1.5	***+9.6***	7.9	0	***+7.9***	**1.7**
Total External No.	***36 No. =>10%: 5***	***135 No. =>10%: 5***	***No. =>7% pts: 7***	***76 No. =>10%: 5***	***95 No. =>10%: 4***	***No. =>7%: 3***	***No. =>7%: 3***
External %	*100.6*	*100.1*		*100.0*	*100.1*		
External % of Grand Total	*27.5*	*29.2*	***Same***	*30.6*	*27.5*	***Same***	
Horizontal %	*21.1*	*78.9*		*44.4*	*55.6*		
Political Cluster:							
Ideology %	21.1	11.1	***+10.0***	20.0	10.1	***+9.9***	**0.1**
Politics %	10.5	24.7	***-14.2***	16.0	23.2	***-7.2***	**7.0**
The Political %	0	7.4	***-7.4***	2.0	7.2	***-5.2***	**2.2**
Political culture %	21.1	24.7	***-3.6***	18.0	27.5	***-9.5***	**5.9**
Political Support %	23.7	1.2	***+22.5***	18.0	1.4	***+16.6***	**5.9**
Political Actors/People %	0	27.2	***-27.2***	6.0	27.5	***-21.8***	**5.4**
Drivers/demands %	15.8	0	***+15.8***	12.0	0	***+12.0***	**3.8**
Political barriers %	0	3.7	***-3.7***	2.0	2.9	***-0.9***	**2.8**
Inclusive process for building political platform %	7.9	0	**+7.9**	6.0	0	***+6.0***	**1.9**
Total Political No.	***38 No. =>10%: 5***	***81 No. =>10%: 4***	***=>7% pts: 7***	***50 No. =>10%: 5***	***69 No. =>10%: 4***	***No. =>7%: 6***	***No. =>7%: 1***
Total Political %	*100.1*	*100.0*		*100.0*	*99.8*		
Political % of Grand Total	*29.0*	*17.49*	***Dif***	*20.2*	*19.9*	***Same***	
Horizontal %	*32.2*	*67.8*		*42.0*	*58.0*		
Internal Cluster:							
Problem, Creativity, Ideas %	24.6	14.6	***+10.0***	6.6	23.1	***-16.5***	**5.9**
Enhance capacity to innovate %	0	5.3	***-5.3***	6.6	2.7	***+3.9***	**1.4**
Internal only %	0	1.2	***-1.2***	0.8	1.1	***-0.3***	**0.9**
Organizational	10.5	7.7	***+2.8***	12.3	5.5	***+6.8***	**4.0**

Types of Grouped Antecedents (Vertical Measures):	**Trail-blazing %**	**Adop-tion %**	**Differ-ence***	**Quant. %**	**Qual. %**	**Dif****	**Dif. Bet. Col. 4 & Col. 7*****
culture/climate %							
Structure %	22.8	11.7	***+11.1***	17.2	11.5	***+5.7***	**5.4**
Innovation process %	14.0	25.1	***-11.1***	32.0	17.0	***+15.0***	**3.9**
Obstacles/Barriers (pull) %	1.8	11.3	***-9.5***	10.7	8.8	***+1.9***	**7.6**
Demand (push, drivers) %	8.8	10.9	***-2.1***	2.5	15.9	***-13.4***	**11.3**
Total People:	***17.6***	***12.1***	***+5.5***	***11.4***	***14.2***	***-2.8***	**2.7**
People only %	8.8	4.4	***+2.1***	5.7	4.9	***+0.8***	**1.3**
Other people %	8.8	6.5	***+2.3***	4,1	8.8	***-4.7***	**2.4**
People/employees/Staff/ individual characteristics %	0	1.2	***-1.2***	1.6	0.5	***+1.1***	**2.3**
Total Internal No.	***57 No. =>10%: 5***	***247 No. =>10%: 6***	***=>7% pts: 4***	***122 No. =>10%: 5***	***182 No. =>10%: 6***	***No. =>7%:3***	***No. =>7%: 2***
Internal Total %	*100.1*	*99.9*		*100.4*	*99.8*		
Internal % of Grand Total	*43.5*	*53.3*	***Same, nearly dif***	*49.2*	*52.6*	***Same***	
Horizontal %	*18.8*	***81.3***		*40.1*	*59.9*	***100.0***	
Grand Total	**131** ***No. =>10%: 15***	**463** ***No. =>10%: 15***	***No. =>7%: 18***	**248** ***No. =>10%: 14***	**346** ***No. =>10%: 13***	***98***	***No. =>7%: 6***
Vertical %	***100.0***	***100.0***		***100.0***	***100.0***		
Horizontal %	***22.1***	***77.9***	**100.0**	***41.8***	***58.3***		
# of documents	**21**	**66**	***87***	**37**	**50**		
% of documents	**24.1**	**75.9**	***100.0***	**42.5**	**57.5**		

Abbreviations*:** No.=Number. ***Definitions of Difference: ***=** Difference in number of mentions for Trailblazing minus number of mentions for Adoption. ****=** Difference in number of mentions for Quantitative minus number of mentions for Qualitative data. *** Difference between trailblazing/adoption and quantitative/qualitative differences. Neutral, i.e. sign not considered. ***Column 8***: Common pattern=<10 percentage points difference of cluster total between columns 4 and 7. Different pattern=>10 percentage points difference. ***Source:*** Paper 1d6: 722. Comparisons of Antecedents of Trailblazing/Adoption and Quantitative/Qualitative Studies of Public Policy Innovation Identified in a Systematic Literature Review – IV

Grouped Antecedent Differences and Similarities were measured (Paper IV) by differences in percentage of grouped antecedents by cluster (Table 2). Trailblazing and adoption literature identified the largest grouped antecedent differences for citizen pressure, governance environment, external drivers, national/state innovation policy, political actors, political support, political drivers, politics, ideology, internal structure, innovation process, problem etc and the people factor. Trailblazing had the larger portions (=>10 percentage point differences) of six grouped antecedents—external environment, external drivers, ideology, political support, problem/creativity/ideas and structure. Adoption had the larger proportions of five grouped antecedents—governance environment, national/state innovation policy, politics, political drivers and the innovation process. The adoption grouped antecedents were more similar to those of quantitative/qualitative studies, with a greater focus on internal cluster, than trailblazing antecedents, with its greater focus on external and political issues (Table 2). Trailblazing was more focused on external and political issues than adoption (Table 2).

Similarities. In external and internal clusters, 2/5 of trailblazing and adoption grouped antecedents were similar proportions (=<10%age points different) of their clusters. Comparing political and internal clusters, 3/5 of trailblazing and adoption grouped antecedents were similar.

Comparing external and political clusters, 4/5 (+/-) of trailblazing and adoption grouped antecedent rankings were similar (Table 2).

Table 3: Types of Studies by Percentage of Cluster

	% External	% Political	% External + Political	% Internal	Neutral Sign % Ext + Pol minus Internal
TR	27.5	29.0	56.5	43.5	+13.0 *Dif*
Adoption	29.2	17.49	46.7	53.3	-6.6 *Sim*
Difference	*-1.7 Similar*	*+11.5 Dif*	*+9.8 Similar*	*-9.8 Similar*	
Quantitative	30.6	20.2	50.8	49.2	+1.6
Qualitative	27.5	19.9	47.4	52.6	-5.2
Difference	*+3.1 Sim*	*+0.3 Sim*	*+3.4 Sim*	*-3.4 Sim*	

Similar=<10%; Different= =>10%. Source: The Author(s).

Large Differences. Table 3 compares cluster portions of trailblazing/adoption and/to quantitative/qualitative antecedents. Cluster portions were similar (<10% different) except trailblazing's portions of political cluster were larger and of internal cluster smaller.

Comparing trailblazing and adoption, of the 28 grouped antecedents, 11 ranked at the same level (purple/ normal text, Table 4a), 17 at different levels (red/bold=trailblazing higher, blue/italics=adoption higher).

Important differences. Cluster differences (Table 3) were equally important for all four types of study for external cluster. Political cluster was more important for trailblazing, internal cluster less important. Internal cluster was more important for all four types of study. If external and political clusters ("external") are combined, they are equally important for adoption, qualitative and quantitative studies but they are different for trailblazing (=>10% difference). The combined "external" cluster is more important for trailblazing than for the other types of study. Trailblazing was the only type of study that was different from the other three.

Comparing Ranked Levels. Table 4a ranks the grouped antecedents of the four types of study by portion of cluster as extremely important (=>30% of cluster), very important (20-<30%), important (10-<20%) and not important (<10%). The most important grouped antecedents are ranked as extremely important and very important. The extremely important grouped antecedents were external environment for trailblazing, citizen pressure for adoption and qualitative, innovation process for quantitative studies. For trailblazing, the most important grouped antecedents were external environment (extremely important), citizen pressure, ideology, political culture, political support, structure and problem etc. (very important). For adoption, the most important grouped antecedents were citizen pressure (extremely important), governance environment, politics, political culture, political actors and innovation process (very important). The most important trailblazing antecedents seem more proactive while the most important adoption antecedents seem more reactive. This is an important finding.

Table 4a: Importance of and Level of Differences among Grouped Antecedents by Trailblazing and Adoption, Ranked by Percent of Cluster

Importance	Trailblazing	Adoption	Quantitative	Qualitative
Extremely Important =>30% of cluster	*External cluster:* **-External environment** Total= 1	*External cluster:* *-Citizen pressure* Total= 1	*External, Political:* *Internal:* **-Innovation process** Total=1	*External cluster:* *-Citizen pressure* Total= 1
Very Important 20-29%	*External cluster:* *-Citizen pressure* *Political cluster:* **-Ideology** -Political culture **-Political support** *Internal cluster:* **-Structure** **-Problem etc.** Total=6	*External cluster:* *-Governance environment* *Political cluster:* *-Politics* -Political culture *-Political actors* *Internal cluster:* *-Innovation process* Total= 5	*External cluster:* *-Citizen pressure* *Political cluster:* **-Ideology** *Internal cluster:* -None Total=2	*External cluster:* *-Governance environment* *Political cluster:* *-Political actors* *-Political culture* *-Politics* *Internal cluster:* *-Problem etc.* Total= 5
Important 10-19%	*External cluster:* **-External drivers** **-External obstacles** **-Influence of other govts** *Political cluster:* *-Politics* **-Political drivers** *Internal cluster:* **-Organizational culture** *-Innovation process* Total= 7	*External cluster:* **-External environment** *-Institutional context* *-National/state innovation policy* *Political cluster:* **-Ideology** *Internal cluster:* **-Problem etc.** **Structure** *-Internal obstacles* *-Internal demand* Total= 8	*External cluster:* -External environment **-National/state innovation policy** *-Governance environment* **-External drivers** *Political cluster:* **-Political support** *-Political culture* *-Politics* **-Political drivers** *Internal cluster:* -Structure **-Organizational culture** **-Internal obstacles** Total= 11	*External cluster:* -External environment *-Institutional context* *Political cluster:* **-Ideology** *Internal cluster:* **-Innovation process** *-Internal demand* -Structure Total= 6
Not important <10%	*External cluster:* *-Institutional context* *-Governance environment* *-National/state innovation policy* *Political cluster:* -The political (0) *-Political actors* -Political barriers -Inclusive process for bldg political platform *Internal cluster:* -Enhance capacity to innovate *-Internal obstacles* *-Internal demand* -Internal only -People only -Other people -People/employees/ etc Total= 14	*External cluster:* **-External drivers, etc.** **-External obstacles** **-Influence of other govts** *Political cluster:* -The political **-Political support (1.2%)** **-Political drivers (0)** -Political barriers -Inclusive process for bldg. political platform (0) *Internal cluster:* -Enhance capacity to innovate **-Organizational culture** Internal only -People only -Other people -People/employees/etc. Total= 14	*External cluster:* *-Institutional context* -External obstacles -Influence of other govts *Political cluster:* -The political *-Political actors* -Political barriers -Inclusive process for building platform *Internal cluster:* -Enhance capacity to innovate *-Problem, etc.* *-Internal demand* -Internal only -People only -Other people -People/employees/etc. Total= 14	*External cluster:* **-National/state innovation policy** **-External drivers** -External obstacles -Influence of other govts (0) *Political cluster:* -The political **-Political support** **-Political drivers** -Political barriers -Inclusive process for building platform (0) *Internal cluster:* -Enhance capacity to innovate **-Internal obstacles** **-Organizational culture** -Internal only -People only -Other people -People/employees/etc. Total= 16

Red & Bold=grouped antecedent more important (minimum one level) in trailblazing and quantitative than adoption and qualitative. ***Blue & Italics***= grouped antecedent more important in adoption and qualitative than trailblazing and quantitative. **Purple**=grouped antecedents at same level of importance. *Source of data*: Author(s), IV.

Considering all four types at both the extremely and very important levels, their external antecedents were quite similar. For political cluster, quantitative literature was most different in having only one political grouped antecedent that was extremely or very important—ideology. In internal cluster, only quantitative literature had an extremely important grouped antecedent—innovation process. Adoption also identified it as very important. Both trailblazing and qualitative studies identified having a problem and ideas as very important. Trailblazing uniquely identified structure as very important.

Some grouped antecedents were more important (higher proportion of their clusters) for trailblazing (red and bold, Table 4a) than for adoption at the most important levels: external environment, ideology, political support, structure and problem/etc. Others were more important for adoption (blue and italics): citizen pressure, governance environment, politics, political actors and innovation process. The higher ranked grouped antecedents for adoption tended to be more structural (governance environment, politics, innovation process, internal structure) and emphasized constraints more than the ones for trailblazing. The trailblazing grouped antecedents were more related to the environment: only two of eleven external grouped antecedents were either extremely important or very important in both trailblazing and adoption—citizen pressure and political culture. Nine were at the same level for both trailblazing and adoption (Table 4a).

Table 4b: Importance of and Level of Differences among Grouped Antecedents by Trailblazing and Adoption, Ranked by Percent of Cluster

Importance	Trailblazing	Adoption	Quantitative	Qualitative
Extremely Important =>30% of cluster	*External cluster:* **-External environment** Total= 1	*External cluster:* -Citizen pressure Total= 1	*Internal cluster:* **-Innovation process** Total=1	*External cluster:* -Citizen pressure Total= 1
Very Important 20-29%	*External cluster:* -Citizen pressure *Political cluster:* **-Ideology** -Political culture **-Political support** *Internal cluster:* **-Structure** -Problem etc. Total=6	*External cluster:* -Governance environment *Political cluster:* -Politics -Political culture -Political actors *Internal cluster:* -Innovation process Total= 5	*External cluster:* -Citizen pressure *Political cluster:* **-Ideology** *Internal cluster:* -None Total=2	*External cluster:* -Governance environment *Political cluster:* -Political actors -Political culture -Politics *Internal cluster:* -Problem etc. Total= 5

Red=unique to trailblazing

External environment was only extremely or very important for trailblazing. The other three types of studies found citizen pressure, governance environment and the innovation process most important. Adoption was more like quantitative and qualitative studies than trailblazing.

Some ranked levels were similar, others different. At the extremely and very important (first two) levels, of 7 grouped antecedents for trailblazing and 6 for adoption, they shared only

one grouped antecedent at a common level (political culture) (Table 4b). Their levels were different for external environment, ideology, political support, structure, governance environment, politics, political actors and innovation process. Some differences are especially interesting, such as political support being very important for trailblazing but not important for adoption. For adoption, interestingly, influence of other governments was not important, yet a common understanding in the innovation field is that governments are mimetic when adopting and disseminating innovations. It was not possible to tell whether this result was found because they were mimetic with something else (e.g. OECD) or the influence of other governments was not considered or it was not considered important to begin with and therefore not explored or it was truly not important.

Table 4c: Comparison of Extremely and Very Important Grouped Antecedents for Four Types of Policy Innovation Research

"Important"	**Type of Study**			
Importance	**Trailblazing**	**Adoption**	**Quantitative**	**Qualitative**
Extremely/ V. Important to 4	-Citizen pressure	-Citizen pressure	-Citizen pressure	-Citizen pressure
Extremely/ V. Important to 3	-Political culture	-Political culture		-Political culture
Extremely/ V. Important to 2	**Ideology** -Politics -Problem etc.	-Governance environment **-Innovation process** -Political actors	**Ideology** **-Innovation process**	-Governance environment -Politics -Problem etc. -Political actors
Extremely/ V. Important to 1	**-External environment** **-Political support** **-Structure**			

Red=unique to trailblazing

When the extremely and very important levels are combined ("important"), more similarities emerge. Table 4c shows that citizen pressure is "important" in all four types of study, political culture in three. Six grouped antecedents are shared by two types. Three are unique to trailblazing. These grouped antecedents were most different from each other, distinguish the types of research well and are good indicators. The best indicators (very different for the most types of research) were citizen pressure and political culture. The other grouped antecedents were good at distinguishing trailblazing/adoption from quantitative/qualitative (important to 2) and trailblazing (important only to trailblazing)

Considering all levels, ten grouped antecedents were more important for trailblazing than adoption: external environment, external drivers, external obstacles, influence of other govts b (external cluster); ideology, political support, political drivers (political cluster); structure, problem etc., organizational culture (internal cluster) (Table 4a). Nine were more important for adoption than trailblazing: citizen pressure, governance environment, politics, political actors, innovation process, institutional context, national/state innovation policy, internal obstacles, internal demand. Nine were equally important: political culture, the political, political barriers, inclusive process for building a political process (although not mentioned in adoption, the difference was not big), enhance capacity to innovate, internal only, people only, other people, people etc. and other

people. Interestingly, people were mentioned most in external (50) vs. internal (40) and political (22) clusters; as well, in "external" cluster people were mentioned more (72 times) than in internal cluster (40 times).

Because of the uncertainties in the data, grouped antecedents measuring two levels (of four) different from each other were highlighted. Different grouped antecedents were therefore assessed as different if they were two levels apart; similar grouped antecedents were assessed as similar if they were at the same level or one level apart (Table 4a). A large difference was considered to be =>20 percentage points of a cluster. Analyzed this way, four large and meaningful differences between trailblazing and adoption emerged: external environment (difference of 20.2 %age points), governance environment (20.2), political support (22.5) and political actors/people (27.2). External environment and political support were two levels higher for trailblazing; governance environment and political actors were two levels higher for adoption. Innovation process was two levels higher for quantitative; political actors and problem etc were two levels higher for qualitative.

Patterns of differences. Differences of differences were explored and compared to each other for trailblazing/ adoption and quantitative/qualitative literature. Antecedents representing <10 percentage points different were defined as similar and compared to those that were different (=>10%age points different). Nine grouped antecedents of trailblazing/adoption were different by =>10 percent and 3 were different uniquely by sign, for a total of 12 grouped antecedents that were different. Seventeen grouped antecedents of trailblazing/adoption were similar and 12 were not similar to the standard, quantitative/ qualitative grouped antecedents. Antecedents in quantitative and qualitative studies were not identical to each other but they were similar. Quantitative/qualitative studies were also compared to trailblazing/adoption studies. There were large differences of differences between quantitative/qualitative and trailblazing/adoption for external environment, policy, institutional context, politics, problem etc., innovation process, internal obstacles and internal demand (Table 2).

Some grouped antecedents had no data in their partner category: 6 in trailblazing, 1 in adoption, 3 in qualitative, 0 in quantitative. In trailblazing, these were policy, the political, political actors, political barriers, enhance capacity to innovate, internal only, and people/employees only. In qualitative, political drivers, inclusive process for developing platform in adoption; influence of other governments, political drivers; in quantitative none (Table 2). These differences may have been real but also may indicate the other category just had not studied the topic.

Comparison with other types of innovation. A number of reviews of innovation antecedent literature have been published. Most were done by the LIPSE scholars, but they offered essentially the same antecedents for all of their studies. They did an SLR that included policy but also processes (De Vries, Tummers and Bekkers, 2018). Antecedents were discussed in private sector, public sector, social and process and policy innovation literature identified in literature reviews, SLRs and meta-analyses. They were compared to the findings in this study of public policy innovation (Paper V). Table 5 summarizes and compares the grouped antecedents, factors and clusters highlighted in the different innovation literatures.

Table 5: Grouped Antecedents and Clusters of Different Types of Innovation

	Process		Policy
Cluster	**Private Sector***	**Public Sector**	**Public Sector**
		Summary 5 Process Studies*	***Summary 2 Policy & Diffusion Studies*****
External	Industry/sector	-Public sector 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)	-External context -Public sector legal culture -State & governance tradition -Social triggers -Quality of relationships within networks ->10%: External environment, citizen pressure, external drivers, external obstacles, influence of other governments, collaboration, coercion, learning in networks, competition. -Mimicry -Proximity
Political	None identified	None identified	-Political culture -Political actors -Political triggers -Political drivers -Political context -People -Political mandates
Internal	Specialization Functional differentiation Professionalism Managerial attitude to change Technological knowledge Administrative intensity Slack External & internal communication	-Traditions -Linking administrative & political leadership -Support for & co-creation with end-users -Triggers -Resources -Internal media/ICT, social media -Risk management -Intra-organizational antecedents -Organizational: structural & cultural features of an organization e.g. organizational slack resources -At 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, 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 innovation environment, innovation 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). *** Author(s), in press on policy trailblazing/adoption (N= 87 publications 1965-2020, 594 antecedents); De Vries, Tummers & Bekkers, 2018 on diffusion/adoption of public sector innovations in 3 fields: social policy, public management (policy & processes), e-government, including policy diffusion, policy convergence, policy transfer (73 publications January 1995 to August 2016). *Source:* Paper V, Table 6.

External cluster antecedents played more of a role in the public than the private sector literature. Political antecedents were only mentioned in the public policy and dissemination literature. Internal cluster was most important in both private and public sector, process and policy literatures: it is the level at which they can easily be compared. Internal antecedents varied somewhat by type of innovation. Not surprisingly, internal cluster was most important for process

and dissemination studies but surprisingly, also for policy studies. Implementation is a major concern in the literature. Trailblazing and adoption had similar portions of external and internal (internal almost different) antecedents but different portions for political antecedents

Comparing trailblazing/adoption and dissemination studies, the external and internal clusters were mentioned most in the trailblazing/adoption study (Table 5). Trailblazing was the only type of study to have a political category. Even when a wider range of studies (including qualitative studies), a larger time frame and non-top ranked journals were considered, internal cluster continued to dominate the public policy innovation literature. The importance of external cluster in De Vries, Tummers & Bekkers' (2018) public sector and Paper II public policy studies was discernably different from the private and public process studies. Trailblazing studies (43.5% internal antecedents) were discernably different from adoption studies (53.3% internal) but not from dissemination studies (40.6% internal antecedents). Adoption was similar to dissemination and they may be compared to each other. Only one SLR of policy antecedents was found. If adoption is treated as essentially the same thing as dissemination, as it seems to be, more studies of policy are needed.

Discussion

Decisions taken during the course of this research about what could influence trailblazing and adoption could have affected the meaningfulness of similarities and differences. Besides definitions, decisions had to be taken as to what similarities and differences would mean. Several considerations were involved, including the following. (1) The studies researched were conducted over 55 years. Dominant terminology, theories and concepts changed during that period—new ones were adopted, others nearly abandoned. This affected how many times antecedent terms appeared. The language used in the original documents was collected and allocated to categories. Antecedents are therefore the most common terms used in the literature during their time. (2) Allocation of antecedents to the grouped antecedents and other categories was conducted by the author(s). Their knowledge, perceptions and biases therefore influenced the decisions. (3) The decision to identify importance quantitatively, by how many times a term or a similar term was used, may have unbalanced importance in unidentified ways. Quantity and quality literature in this study, e.g. had some differences in their grouped antecedents (Table 2). (4) Some of the grouped antecedents appear to be mirror images of each other, e.g. drivers and obstacles. Should they have been combined into one grouped antecedent as some authors have done? Doing so would have lost the direction of their action and so was not chosen.

Best antecedent indicators of trailblazing/adoption of public policy innovation, based on the SLR, were identified. Table 4a organized the grouped differences of differences of antecedent proportional mentions according to whether trailblazing and adoption grouped antecedents scored similarly or differently and how different they were. Large differences of differences (=>7%age points) are considered indicators. Trailblazing scored high differences for external environment, problem etc, and structure (3) (Table 6). Adoption scored high differences for governance environment, national/state innovation policy, institutional context, citizen pressure, political actors, politics, the political, innovation process, and internal obstacles (9). Grouped antecedents scoring differently also distinguished trailblazing/adoption from quantitative/qualitative studies (used as the standard), as opposed to similar scores, which did not distinguish them. Their

distinguishing grouped antecedents (=>7%age points difference) included external environment, external drivers, governance environment (external cluster); politics (political cluster); internal demand, other people (sign), people/employees etc (sign), (internal cluster) (both major differences and sign differences[1] included). Trailblazing/adoption and quantitative/qualitative had different signs for 6 grouped antecedents but only 3 of them were different from ones already identified (Table 6).

Table 6: Patterns in Difference of Differences (< & =>10%age points) that Grouped Antecedents Represent of their Clusters, Trailblazing/Adoption

Similar Patterns <10%	**Different Patterns (Difference of Differences =>10% points)**	
Similar Pattern	***Major Difference (=no pattern)***	***Sign Difference (=no pattern)***
External cluster: -institutional context; -citizen pressure; -external obstacles; -influence of other governments 4 grouped antecedents	External cluster: -external environment (20.2%age points) (TR higher) -governance environment (20.2) (adopn higher) -external drivers (15.0) (TR higher) -national/state innovation policy (12.6) (adopn higher) 4 grouped antecedents	External cluster: -national/state innovation policy (sign) (adopn higher) 1 grouped antecedent
Political cluster: -the political; -political culture; -political support; -political actors; -political drivers; -political barriers; -inclusive process, platform. 7 grouped antecedents	Political cluster: -political actors (27.2) (Adopn higher) -political support (22.5) (TR higher) -political drivers (15.8) (TR higher) -politics (14.2) (adopn higher) -ideology (10.0) (TR higher) 5 grouped antecedents	Political cluster: - none 1. 0 grouped antecedents
Internal cluster: -internal obstacles; -enhance capacity to innovate; -organizational culture; -other people; -people only; -people/employees, etc; -internal only 7 grouped antecedents	Internal cluster: -structure (11.1) (TR higher) -innovation process (11.1) (Adopn higher) -problem, creativity, ideas (10.0) (TR higher) 3 grouped antecedents	Internal cluster: -enhance capacity to innovate (sign) (TR/adopn same) -innovation process (sign) (adopn higher) -obstacles (sign) (TR/adopn same) -other people (sign) (TR/adopn same) -people/employees/staff/individual characteristics (sign) (TR/adopn same) 5 grouped antecedents
18 grouped antecedents similar	*12 grouped antecedents with major differences	6 grouped antecedents with different signs (3 sign overlaps with column 2)

* Columns 1 and 2 add to 29 instead of 28 because the factor total people is included. It is not elsewhere. Adopn=adoption.
Source: Table 2; Paper IV.

Indicator grouped antecedents. To identify an optimal number and which grouped antecedents need consideration in predicting trailblazing/adoption of public policy innovation, various approaches were explored (Appendix A). The difference between trailblazing and adoption indicators is provided in Table 2, column 4. An indicator of =>10 percentage points of difference found 13 indicators, too few; a difference of 5 percentage points found 21 indicators, too many.

[1] I not convinced sign differences between trailblazing/adoption and quantitative/qualitative are meaningful but include them for discussion purposes.

An indicator of =>7 percentage points difference found 18 indicators (Appendix A, column 7) and was chosen. A 7% difference found 12 indicators for quantitative/qualitative).

Conclusion

The decision was taken to use the 18 indicators of =>7%age points difference as the best set of indicators because they should be a sufficient number of indicators and they are the most distinct in the literature (have the greatest differences of percentage differences) (Table 7).

Table 7: Best Indicators of Differences between Trailblazing/Adoption and Quantitative/ Qualitative Studies of Public Policy Innovation, Based on SLR*

	External-Higher	***Political-Higher***	***Internal-Higher***
High ranks TR vs Adoption	*Trailblazing:* -external environment/context -external drivers -influence of other governments/regions *Adoption:* -governance environment -national/state innovation policy -institutional context -citizen pressure 7	*Trailblazing:* -political support -political drivers -ideology -inclusive process for building platform *Adoption:* -political actors -politics -the political 7	*Trailblazing:* -structure -problem, creativity, ideas -enhance capacity to innovate *Adoption:* -innovation process -internal obstacles 4 T=18
High ranks Quant. vs. Qual.	*Quantitative:* -influence of other governments/regions *Qualitative:* -governance environment -citizen pressure 3	*Quantitative:* -political support -political drivers -ideology *Qualitative:* -political actors -political culture -politics 6	*Quantitative:* -innovation process *Qualitative:* -problem etc. -internal demand 3 T=12

Abbreviations: TR=trailblazing; Quant=quantitative; Qual=Qualitative; Dvg=developing; T=total.
* <7% difference of difference=a pattern, =>7%age point difference=no pattern, a good indicator of difference, listed in order magnitude of difference. Source: Table 2, column 4, 7.

Framework/Patterns. These best indicators could form a framework for indicator antecedents of trailblazing/adoption of public policy innovation. What kind of picture of antecedents would this create? Trailblazing paid most attention externally to the ecology of the innovation, politically to the political ecology, internally to the internal structure and the problem/ideas. Adoption paid most attention externally to the external structure and citizen pressure, politically to the political ecology, internally to the ecology of the innovation process and internal obstacles. Trailblazing was more concerned with the external and political ecology, the government's structure and problems. Adoption was more concerned with external structure, pressure groups, transactions and obstacles. Quantitative and qualitative literature, the standard, had identical indicators, based on importance as to trailblazing/adoption since they used the same data (Table 7). While sign differences were calculated (Table 3, 6), they were not used to

determine indicators because they did not indicate a meaningful difference (trailblazing/adoption minus quantitative/qualitative studies) for that purpose. Trailblazing percentages minus adoption percentages and quantitative minus qualitative are meaningful differences. The best grouped antecedent indicators identified in the SLR analyses are summarized in Table 7.

I tried to determine which antecedents were most likely to predict adoption of innovation, i.e. were better at doing so. The only information I had was antecedents that authors had identified and how many times they had identified them. The ones identified in the literature and analyzed as indicators in this Issue identified their benefits based on how many times they were mentioned, and explored their relationships. It would be preferrable that indicators retain the same definitions over time, to permit comparisons, but this did not happen as public administration changed, followed trends and ideology and changed the theories employed.

Interestingly, the only major differences found among the four types of study (trailblazing, adoption, quantitative, qualitative) was the larger proportion of political and lower proportion of internal antecedents for trailblazing. At the same time, there were only two differences of differences that met the criterion (=>7%) (Table 2, column 8) where trailblazing was higher. They were external environment and politics. The grouped antecedents with larger differences of differences between trailblazing/adoption and quantitative/qualitative studies were external environment, external drivers, and governance environment (external cluster); politics (political cluster); internal demand and internal obstacles (Table 2, column 8).

Policy implications. Study of trailblazing and adoption of policy innovations both required a method to link with/relate to external, political and internal environments in creating new policies. Typically, public (civil) servants have related to an innovation's environment through elected officials, especially ministers. Although they live in society, public servants, especially professionals are often not active in it, as bureaucratic positions are highly time consuming. Moreover, neoliberal governments have often been suspicious of public servants and so have not sought their advice and have isolated them from the policy development process; thus, in neoliberal governments the details of policy innovation, dissemination (transfers) and changes have usually come from the political arena and Cabinet. Progressive parties' platforms have focused more on problems, promising to deal with them; neoliberal governments have sought to increase resentment. In the past, policy public servants were asked to think through alternatives and recommend a solution. Platforms and cabinet identified the targets of solutions, public servants identified ways the government's goals and objectives could be accomplished. In right-wing governments, the tendency is more toward one right solution (although all parties tend somewhat in this direction), prescribed by the political arena, which was mimetic with other right-wing partners and governments, especially U.S. Republican parties, governments and policies. This is not surprising as other governments, including left-wing governments have also imitated each others' policies. In the U.S. government, the top 4-5 levels of the public service have partisan appointments, in Canada, the top two levels. Canadian public servants are allowed to engage in political activities but not in the workplace; many European public servants are allowed to express political opinions in the workplace.

This raises questions: If policies have been mimetic and recent governments have been ideological, why have so many different antecedents been identified? Have the antecedents

changed? Have the same innovative policies been implemented in many different environments (international organizations have encouraged imitation)? Have they been implemented appropriately or inappropriately? Has policy dissemination been truly mimetic? Scholars and practitioners identified 508 unique antecedents of policy innovation. Most of the proportions of clusters for trailblazing/adoption and quantitative/qualitative antecedents were similar (<10% different). Only one cluster for one type of study had a distinct difference from the others (=>10% points)—political cluster was different for trailblazing (29% of all grouped antecedents) and adoption (17.49%), a difference of 11.5 percentage points. The proportions for internal cluster for trailblazing and adoption were close to different (43.5, 53.3%, a difference of 9.8%age points), but external cluster was not (27.5% vs. 29.2%, very close proportions) (Table 3). According to the literature, political cluster plays more of a role in trailblazing of policy innovation than in adoption, which focuses more on established government processes and internal antecedents.

The main weakness of this research is that a limited number of trailblazing studies (21) and antecedents (171) have been done, such that their antecedents may have led to wrong emphases. More research is needed on antecedents of trailblazing of policy innovation.

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Appendix A: Comparison of Indicators Identified in Different Analyses, SLR of Antecedents of Policy Innovation

	4 Types: % of 3 Clusters (T. 3)	**4 Types: Difs of Grpd Antecedents 2 clusters** "External" vs. Internal (T. 3)	**As Prop. (%) of its Cluster** =>10% (T. 2, Col. 2, 3, 5, 6)	**Ranked Importance***	**Difs =>10%** -TR minus Adopn (T. 2, Col 4) -Quant minus. Qual, (T2, Col. 7)	**Dif of Difs =>7%age points (**T. 2, Col. 8)
Trail-blazing:	Different from adopn, Q, Q for Political (T. 3)	TR & Adopn similar (almost dif, 9.8%age points dif) but political cluster dif (T. 3)	10% (vs. 7%) typically adds 2 grouped antecedents.	Identifies concentrations (see under table)	-21 grouped antecedents with similar difs of difs -7 major difs of difs (major dif). Same: TR, Adopn, Quant, Qual	**TR, Adopn, Quant, Qual Same**
External:	Similar to Adopn, Quant, Qual	Ext +Pol similar, almost different (9.8/ 10 %age points dif)	*TR higher:* -External env 30.6% -External drivers 19.4% -External obstacles 11.1% -Influence of other govts 11.1% *72.2% of cluster* -Concentrated *Adoption Higher:* -Citizen pressure 31.1% -Governance env 23.0% -Policy 12.6% -Institutional context 11.9% *72.8% of cluuster*	*TR higher:* -External environment (EI) 30.6% *Adopn higher:* -Citizen pressure (VI) 31.1% *61.7% of cluster* -concentrated	*TR more:* -External environment 20.2%age points -Ext drivers 15.0%age pts *Adopn more:* -Gov'ance env 20.2%age pts -Nat/State innovn policy 12.6%age pts	*TR/adopn higher:* -External environment 13.4%age pts -Ext. drivers 9.8%age pts -Gov'ance env 7.8%age pts *Quant/qual higher:* -None
Political	Different (more) TR more pol-itical than adopn (11.5%ag e points dif) than Q, Q	TR Ext +Pol moe but similar, almost different (9.8/ 10 %age points dif)	*TR higher:* -Political support 23.7% -Ideology 21.1% -Political drivers 15.8% *60.6% of cluster* -concentrated (Political culture 21.1%*)* *Adopn higher:* -Political actors 27.2% -Politics 24.7% -Political culture 24.7% *76.6% of cluster* -concentrated	*TR higher:* -Political support 23.7% -Ideology 21.1% *Adopn higher:* -Political culture 24.7% *69.5% of cluster* -concentrated	*TR more:* -Political support 22.5%age pts -Political drivers 15.8%age pts (adopn=0) -Ideology 10.0%age pts *Adopn more:* -Political actors 27.2%age pts (TR=0) -Politics 14.2%age pts	*TR/adopn higher:* -Politics 7.0%age points *Quant/Qual higher:* -None

	4 Types: % of 3 Clusters (T. 3)	**4 Types: Difs of Grpd Antecedents 2 clusters** "External" vs. Internal (T. 3)	**As Prop. (%) of its Cluster** =>10% (T. 2, Col. 2, 3, 5, 6)	**Ranked Importance***	**Difs =>10%** -TR minus Adopn (T. 2, Col 4) -Quant minus. Qual, (T2, Col. 7)	**Dif of Difs =>7%age points (**T. 2, Col. 8)
Internal	Similar to Adopn, Quant, Qual	TR less But similar, almost different (9.8/10%age points dif)	*TR higher:* -Problem etc. 24.6% -Structure 22.8% -Org culture 10.5% *57.9% of cluster* -Somewhat concentrated *Adopn higher:* -Innovn process 25.1% (TR 14.0%) -Org culture 10.5% *35.6% of cluster* -not concentrated	*TR higher:* -Problem etc. 24.6% -Structure 22.8% *Adopn higher:* -none *47.4% of cluster* -less concentrated	*TR more:* -Structure 11.2%age pts -Problem etc. 10.0%age pts *Adopn more:* -Innovn process 11.1%age pts	*TR/adopn higher:* -Enhance capacity to innovate 9.2%age points *Quant/qual higher:* -Problem etc. 26.5%age points -Internal demand 11.3%age points -Total people 8.3%age points -Other people 7.0%age points
		7	9	7	7	15 (2 peo)
Adop-tion:	(T.3) Similar to TR, Quant, Qual	Adopn & TR similar (almost dif, 9.8%age points dif/10%age pts) (T. 3)			TR, Adopn, Quant, Qual Same	**TR, Adopn, Quant, Qual Same**
External	Similar to TR, Quant, Qual	Similar 1.7%age points dif -Citizen pressure 8.3%age pts -Gov'ance env 20.2%age pts	*Adopn Higher:* -Citizen pressure 31.1% -Governance env 23.0% -Policy 12.6% -Institutional context 11.9% *72.8% of cluster* (External env 10.4%) *TR higher:* -External environment 30.6% -External drivers 19.4% -External obstacles 11.1% -Influence of other govts 11.1% *72.2% of cluster*	-Citizen pressure 31.1% -Governance env 23.0% *54.1% of cluster* -somewhat less concentrated	*Adopn more:* -Gov'ance env 20.2%age pts -Nat/State innovn policy 12.6%age pts *TR more:* -External environment 20.2%age pts -Ext drivers 15.0%age pts	*TR/adopn higher:* -Nat/state innovn policy18.4%age pts -External environment 13.4%age pts -Instit'al context 12.8%age pts -External drivers 9.8%age pts -Gov'ance env 7.8%age pts *Quant/qual higher:* -None
Political	Dif from TR, similar to Quant,	Dif. Adopn less (11.5%age points dif)	*Adopn higher:* -Political actors 27.2% (TR=0) -Political	-Politics 24.7% -Political culture 24.7%	*Adopn more:* -Politics 14.2%age pts -Political support 22.5%age pts	*TR/adopn higher:* -None *Quant/Qual*

	4 Types: % of 3 Clusters (T. 3)	**4 Types: Difs of Grpd Antecedents 2 clusters** "External" vs. Internal (T. 3)	**As Prop. (%) of its Cluster** =>10% (T. 2, Col. 2, 3, 5, 6)	**Ranked Importance***	**Difs =>10%** -TR minus Adopn (T. 2, Col 4) -Quant minus. Qual, (T2, Col. 7)	**Dif of Difs =>7%age points (**T. 2, Col. 8)
	Qual.		culture 24.7% -Politics 24.7% *76.6% of cluster* *TR higher:* -Political support 23.7% -Ideology 21.1% -Political drivers 15.8% *81.7% of cluster* -concentrated	-Political actors 27.2% *76.6% of cluster* -concentrated	-Political drivers 15.8%age pts *TR more:* -Political actors 11.1%age pts -Ideology 10.0%age pts	*higher:* -Politics 7.0 *TR/adopn higher:* -None
Internal	Similar to TR, Quant, Qual Almost dif from TR (9.8/ 10 %age points)	Adopn more (9.8%age points dif)	*Adopn higher:* -Innovation process 25.1% (TR 14.0%) -Internal demand 10.9% *36.0% of cluster* -less concentrated than external & political	*Adopn high:* -Problem etc. 14.6% (TR is 24.6) *Adopn higher:* -Innovn process process 25.1% *39.7% of cluster* - Less concentrated	*Adopn more:* -Innovn process 11.1%age pts *TR more:* -Structure 11.1%age pts -Problem etc. 10.0%age pts	*TR/adopn higher:* -Enhance capacity to innovate 9.2%age pts -Internal obstacles 11.4%age pts *Quant/qual higher:* -Problem etc. 26.5%age pts -Innovn process 26.1%age pts -Internal demand 11.3%age pts -Total people 8.3%age pts -Other people 7.0%age pts
			10	6	7	15 (2 peo)
Quan-titative	Similar (T.3)			T2	TR, Adopn, Quant, Qual Same	**TR, Adopn, Quant, Qual Same**
External	Similar to Qual.	Similar to Qual	*Quant high:* -Citizen pressure 22.4% (Qual 31.1%) -Governance env 11.8% (Qual 24.2%) *Quantitative higher:* -External env 18.4% -Nat/state innovation policy 13.2% -External	Citizen pressure (V.I) 22.4% -Not concentrated	*Quant more:* -None *Qual more:* -Governance env 12.4%age pts -Citizen pressure 12.3%age pts	*Quant/qual higher:* -None *TR/adopn higher:* -External env 13.4%age pts -Instit'al context 12.8%age pts -Gov'ance env 7.8%age pts -Nat/state innovn policy 18.4%age pts -Ext. drivers

	4 Types: % of 3 Clusters (T. 3)	**4 Types: Difs of Grpd Antecedents 2 clusters** "External" vs. Internal (T. 3)	**As Prop. (%) of its Cluster** =>10% (T. 2, Col. 2, 3, 5, 6)	**Ranked Importance***	**Difs =>10%** -TR minus Adopn (T. 2, Col 4) -Quant minus. Qual, (T2, Col. 7)	**Dif of Difs =>7%age points (**T. 2, Col. 8)
			drivers 10.5% *76.3% of cluster* -concentrated			9.8%age pts
Political	Similar to Qual.	Similar to Qual	*Quant high:* -Political culture 18.0% (Qual 27.5) -Politics 16.0% (Qual 23.2%) *Quant highest:* -Ideology 20.0% -Political support 18.0% -Political drivers 12.0% (Qual=0) *84.0% of cluster* -concentrated	*Quant bigger:* -Ideology 20.0% -not concentrated	*Quant more:* -Political support 22.5%age pts -Political drivers 12.0%age pts *Qual more:* -Political actors 21.8%age pts	*Quant/Qual higher:* -Politics 7.0%age pts *TR/adopn higher:* -None
Internal	Similar to Qual.	Similar to Qual	*Quan high:* -Total people 11.4% (Qual 14.2%) Quant highest: -Innovation process 32.0% -Structure 17.2% -Org'al culture 12.3% -Internal obstacles 10.7% *83.6% of cluster* -concentrated	-Innovn process (E.I.) 32.0% -Problem etc. 23.1% *55.1% of cluster* -somewhat less concentrated	*Quant more:* -Innovn process 15.0%age pts *Qual more:* -Problem, etc. 16.5%age pts -Internal demand 13.4%age pts	*Quant/qual higher:* -Problem etc. 26.5%age pts -Innovn process 26.1%age pts -Internal demand 11.3%age pts -Total people 8.3%age pts -Other people 7.0%age pts *TR/adopn higher:* -Internal obstacles 11.4%age pts -Enhance capacity to innovate 9.2%age pts
			10	3	7	15 (2 peo)
Qual-itative:	Similar (T.3)	(T.3)	Qualitative higher		TR, Adopn, Quant, Qual Same	**TR, Adopn, Quant, Qual Same**
External	Similar to Quant.	Qual similar to Quant	*Qual high:* -External env 11.6% (Quant 18.4%) *Qual highest:* -Citizen pressure 34.7%	-Citizen pressure 34.7% -Gov'ance env 24.2% *58.9% of cluster*	*Qual more:* -Citizen pressure 12.3%age pts -Governance env 12.1%age pts *Quant more:* -None	*Quant/qual higher:* -Influence of other govts 7.9%age pts *TR/adopn higher:*

	4 Types: % of 3 Clusters (T. 3)	**4 Types: Difs of Grpd Antecedents 2 clusters** "External" vs. Internal (T. 3)	**As Prop. (%) of its Cluster** =>10% (T. 2, Col. 2, 3, 5, 6)	**Ranked Importance***	**Difs =>10%** -TR minus Adopn (T. 2, Col 4) -Quant minus. Qual, (T2, Col. 7)	**Dif of Difs =>7%age points (**T. 2, Col. 8)
			(Quant 22.4%) -Governance env 24.2% -Institutional context 11.6% *82.1% of cluster* -Concentrated	-Somewhat less concentrated		-External environment 13.4%age pts -Instit'al context 12/8%age pts -Gov'ance env 7.8%age pts -Nat/state innovn policy 18.4%age pts -Ext. drivers 9.8%age pts
Political	Similar to Quant.	Similar to Quant	*Qual high:* -Ideology 10.1% (Quant 20.0%) *Qual highest:* -Political culture 27.5% -Political actors 27.5% -Politics 23.2% *78.2% of cluster*	-Political culture 27.5% -Political actors 27.5% -Politics 23.2% *72.5% of cluster* -Concentrated	*Qual more:* -Political actors 16.5%age pts *Quant more:* -Political support 16.6%age pts -Political drivers 12.0%age pts	*Quant/Qual higher:* -Politics 7.0%age pts *TR/adopn higher:* -None
Internal	Similar to Quant.	Similar to Quant	*Qual high:* -Innovn process 17.0% (Quant 17.2%) -Structure 11.5% (Quant 17.2) *Qual highest:* -Problem etc. 23.1% -Internal demand 15.9% -Total people 14.2% *81.7% of cluster* -concentrated	-Problem etc. 23.1% -Innovn process 32.0 *55.1% of cluster* -Somewhat concentrated	*Qual more:* -Problem, etc. 16.5%age pts -Internal demand 13.4%age pts *Quant more:* -Innovn process 15.0%age pts	*Quant/qual higher:* -Problem etc. 26.5%age pts -Innovn process 26.1%age pts -Internal demand 11.3%age pts -Total people 8.3%age pts -Other people 7.0%age pts *TR/adopn higher:* -Enhance capacity to innovate 9.2%age pts -Internal obstacles 11.4%age pts
			9	6	8	14

Abbreviations: T.=Table. Category (of 4) determined by its highest score among the 4; Prop=proportion; Dif-Difference; Org=organization; "External"=External + Political clusters. ***Ranked Importance**: Extremely Important (EI) (=>30%) + Very Important (VI) (=>20 - <30% pts) (T. 4). Very concentrated = =>70%; Concentrated = 40-<70%; Somewhat less concentrated=50-<60%; Less concentrated= 30 - <50%; Not concentrated = <30%.