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Seeing the Forest for the Trees: An Atlas of the Politics–Administration Dichotomy

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Recent years have seen attempts to make sense of the politics–administration dichotomy. Triangulating among historical research, empirical observations, new models of interaction between politicians and administrators, and the division of the literature into "schools," novel ways of understanding and examining the dichotomy have developed. These have been largely thematic and have revealed the extent of a literature spanning more than 120 years. Because of its size, a complementary structural analysis of the literature now not only is conceivably useful but also can offer means for approaching it. This article offers an atlas—that is, a series of visual maps, accompanied by associated statistics and interpretations—that can assist researchers in their travels through the territory of the dichotomy. Ten ways of tackling the literature are presented, culminating in an initial reading list that covers the breadth of dichotomy research, thus providing an epistemological foundation for those who wish to enter the territory.

Recent years have seen attempts to make sense of the politics–administration dichotomy. Triangulating between historical research (Overeem 2012), empirical observations (Demir 2009a), new models of interaction between politicians and administrators (Svara 1985, 2001, 2006a, 2006b), and the division of the literature into "schools" (Demir 2009b), novel ways of viewing, critiquing, understanding, and examining the dichotomy have developed. These have been largely thematic and have revealed the voluminous extent of a literature spanning more than 120 years. Because of its size, a complementary structural analysis of the literature now not only is conceivably useful but also can offer means for approaching it. To this end, what is offered here is an atlas—that is, a series of visual maps, accompanied by associated statistics and interpretations—that can assist researchers in their travels through the territory of the politics–administration dichotomy.

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The atlas is designed as a networked bibliography, extracted specifically from the American literature, of journal articles pertinent to the dichotomy for the period 1887–2010. The network is subjected to five analyses chosen for their broad relevance to bibliographic networks. Some highlights of the results from these analyses include, for example, (1) the extent of the complementarity turn in dichotomy studies, triggered in the mid-1980s; (2) the identification of a subgroup of classical papers that continue to command attention in contemporary dichotomy research; and (3) the qualified overall dominance of *Public Administration Review* set against a growing diversification of journals publishing dichotomy studies. In addition, the application of network theory enables the identification of an initial reading list that covers the breadth of the literature's 123 years, thus providing an adequate epistemological foundation for those who wish to enter the territory. Ultimately, 10 means for approaching, or entering, the dichotomy literature are identified.

In order to appreciate the final product for what it is, the first task is to qualify the term "networked bibliography" and the criterion employed for the inclusion of journal articles within it. For convenience, in what follows, the bibliographic network to be presented will be referred to as the "dichotomy network."

Terms of Reference

As with models in general (Morgan and Morrison 1999), networks are representational tools for investigating some aspect of the world. Their accuracy reflects, and results from, design criteria, not least concerning issues of data inclusion and exclusion, as well as of

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technique particular to network modeling itself. Those most relevant to the dichotomy network are outlined here.

Networks are underpinned by the abstract mathematical field known as "graph theory" (Gross and Yellen 2006; Newman 2010) and thus are amenable to quantitative explorations. Their basic representational objects are vertices connected by lines. Symmetrical/reciprocal relationships between vertices are represented by undirected lines, or "edges," while asymmetrical relationships are represented by directed lines, or "arcs." Both types of lines will be used here, with edges appearing as a result of certain particular analyses.

The fundamental advantage of networks lies in relational explorations. In this respect, the dichotomy network is a bibliographical network in which the arcs represent citation links between journal papers, which, in turn, are represented by vertices. In this "citation network," a paper at the tail of an arc—the "citee"—is cited by a paper at the head of the arc—the "citer." The terms "citee" and "citer" will refer to papers as opposed to any individual author. In graph-theoretical terminology, the sum of arrows leaving a citee constitute its "outdegree." Conversely, the sum of arrows reaching a citer constitute its "indegree." This useful shorthand will be adopted.

Interest in citation networks stems from Garfield's (1955, 108, 111) initial considerations on general bibliometrics, which can be traced back to Lotka (1926). Garfield proposed "a bibliographic system for science literature that can eliminate the uncritical citation of fraudulent, incomplete, or obsolete data by making it possible for the conscientious scholar to be aware of criticisms of earlier papers." It is worth noting that Garfield did not propose a system that, of itself, would perform the desired elimination and thus substitute for scholars' own judgments. Garfield intended a map of the "association of ideas" that could *assist* "conscientious" scholars in their documentary search. He also pointed out that the "system" could be used to calculate "impact factors," but he concluded, almost as a warning, that the system itself as well as its results are "just a starting point in literature research." The dichotomy network is offered as just such a starting point.

This initial warning on the limitations of citation networks has spawned extensive reflections in its literature. They are summarized by Garfield (1979b) and MacRoberts and MacRoberts (1989). The most basic point is that the network itself does not say anything about the content of the citations. Jo et al. note that "the quality of a citation is unknown without further contextual examination of the citation context," adding that "a citation network never provides qualitative information on the relationship among articles except for the existence of a citation" (2009, 519). In other words, the network can only offer results that speak of its structure, that is, the positioning of citations in relation to each other. Researchers can then use such results as pointers for inquiring into, and interpreting the content of, the items cited. Two particular structural approaches developed for bibliographic networks will be pursued here: (1) the conjoining of papers through "coupling" and "co-citations" and (2) the detection of the "main path" through the network.

Couplings were first proposed by Kessler (1963) in the early 1960s as bibliographic pairings of citers based on the citees they share. Ten years later, Small (1973) pointed out that this backward-looking approach does not focus on the evolution of a literature and, conversely to coupling, proposed co-citation, whereby citees are paired based on the frequency with which they appear jointly in citers. With co-citation, as the literature, and especially the distribution of citations, evolves, so do clusters of citees, allowing for longitudinal explorations of changes in a field of scholarship. Variations in coupling and co-citation computations are discussed by Batagelj and Cerinšek (2013). Here, coupling and co-citation will be pursued based on the classic approaches by Kessler and Small, and interpretations of the results will be offered.

Main path analysis uncovers a chronologically ordered stream of papers, spanning the entire network from beginning to end, which appear on a greater number of citation paths than others. Their prominence is hypothesized as rendering explicit the essential stream of research within a given literature. Three variations were first proposed by Hummon and Doreian (1989) in the late 1980s, and a number have been developed since (Hummon, Doreian, and Freeman 1990; Liu and Lu 2012; Lucio-Arias and Leyesdorff 2008). Batagelj's (2003) variation—known as search path count (SPC)—has been generally adopted (Jo et al. 2009; Liu et al. 2013; Lu et al. 2012) and serves as the foundation for more advanced variations (Liu and Lu, 2012). Batagelj's SPC is also included in the network analysis software *Pajek* (De Nooy, Mrvar, and Batagelj 2011, 282–88), which was used for developing and exploring the dichotomy network. SPC has become a central feature of citation network explorations, and accordingly, it will be applied to the dichotomy network.

Design Criterion of the Dichotomy Network

Citation networks are usually constructed based on wholesale extractions from digitally searchable bibliographic databases. These databases are essentially archival deposits, and their nature, as well as the practice of extracting citations en masse (e.g., Lucio-Arias and Leydesdorff 2007, 2008), raises some specific modeling problems summarized by Marsden (2005, 24–25).

For example, citation counts may be inaccurate because of changes in journal names or nonstandard journal abbreviations. Editorial policies affect which indexing services track which journals, rendering no database unqualifiedly comprehensive and the availability of records therein eclectic. Citations themselves do not simply contribute to the flow of knowledge: they have been found to generate information cascades resulting in unfounded authority claims (Greenberg 2009). Furthermore, citations may be used for other purposes, such as window dressing, self-citation, paying homage, politically motivated flattery, offering corrections, opening disputes, describing methodologies, or simply offering a literature review (Hummon and Doreian, 1989, 40). Citation practices, and the possible meanings of citations, have also been found to differ across research areas (Hargens 2000).

Given such variety in citation characteristics, Marsden notes that "[r]elatively few explicitly methodological studies of archival data appear in the network literature" (2005, 24), resulting in a network developer having to use those analytical tools that appear to be most relevant to the context at hand and to the objectives concerning the final product. In this respect, Marsden concludes, "Assessments of data quality, regardless of source, will be facilitated if researchers clearly articulate their concepts of the 'true scores' they seek to

capture with empirical indicators of network ties" (2005, 26). In other words, any network that is developed must be accompanied by the criteria used for its development—otherwise, the results and the interpretations risk being ambiguous and ultimately unhelpful. Accuracy arises in proportion to explicitly defined criteria, which, for their part, govern the effort expended in consulting the content of the citations eventually included or omitted from a network.

The design criterion for including papers in the dichotomy network is borrowed from Overeem's (2012) *The Politics–Administration Dichotomy: Toward a Constitutional Perspective.* Overeem's book (2012, 137–89), appearing 125 years after Wilson's (1887) seminal paper, offers a "reconstruction" of numerous issues that have surrounded and penetrated the dichotomy over the decades in order to revitalize the dichotomy within constitutionalism and reconcile it with another of those wider issues in which it has played a part, namely, the separation of powers doctrine. Overeem's wider objective is to make conceptual sense of the dichotomy by offering "a combination of a history of ideas approach and … a theoretical approach" in order "to examine, first, what the dichotomy has meant from its earliest appearance to the present, and then also to examine what it can (and maybe should) mean in our time" (2012, 15). As such, he is less concerned with dissecting empirical/case studies and more concerned with underlying theory, the bulwarks of its argumentation, its cohesion, and its clear exposition in order to inform any eventual practice.

Reflecting this interest, the design criterion of the dichotomy network is such that papers are included that, over the course of decades, have contributed to the conceptual and theoretical debate about the dichotomy. Accordingly, any one citation link in the network indicates that the citee was used by the citer when discussing conceptual and/or theoretical issues.

This narrow design criterion requires detailed consultation of the content of papers. On the one hand, such attention offers the advantage of avoiding the aforementioned problems associated with wholesale incorporations of citation links in favor of greater accuracy in compositional content than might otherwise be the case. This includes technical corrections, for example, of Demir's (2009b) errors in referencing Finer's (1941) and Levitan's (1943) papers as having been published in 1940. On the other hand, possible unwarranted omissions from the network are not beyond argument. Garfield notes that "producing a citation network of appreciable size and utility is a massive materials-handling and information-processing job" (1979a, 25). This is compounded when the network's citation links are inserted according to the content of papers and not through wholesale incorporation of their reference lists. Following the latter practice would result in a more comprehensive network but at the cost of adequate utility and loss of focus. The dichotomy network does not promise comprehensiveness but rather adequacy, relevance, and utility as an orientation device through its constitutive literature in accordance with its design criterion.

Ultimately, the boundary of the dichotomy network has been set following a series of reflections and judgments in the face of the contents of those items about which decisions of inclusion and exclusion have had to be made, the main interest being to offer an expanded coverage without sacrificing conformance to the design criterion. This follows the "nominalist" approach to network construction (Wasserman and Faust 1994, 31–32), whereby the boundary of the network is set in accordance with a specific topic of interest. If such a boundary encloses an enumerable set of items appreciable as constituting the population of interest, there is no need for sampling and statistical inference (Kolaczyk 2009). The design criterion of the dichotomy network allows for a clearly identifiable set of papers whose bibliographies explicitly define the connecting arcs between them, resulting in a complete network that is open to structural exploration. The task here, therefore, is not one of inference or testing for random effects but rather of interpretive description based on structural features. Such an exploratory approach is valued and extensively promoted in network studies, not only for learning about networks in general (De Nooy, Mrvar, and Batagelj 2011) but also when studying fields as diverse as international relations (Maoz 2011) and "dark" (or illicit) networks (Everton 2012).

Overeem's bibliography stops at the year 2010. This offers a convenient cutoff date for the dichotomy network: it provides an initial glimpse into the decade beginning in 2010 and also allows for the network's potential future development with each passing chronological decade. Apart from this date and the design criterion, however, the content of the dichotomy network does not reflect Overeem's bibliography en masse. Of the 161 papers that he cites, for instance, only 60 appear in the network, contributing less than two-fifths of its content. This divergence is attributable to the particular objectives and discourse in Overeem's work. For example, of the three papers from 2010 cited by Overeem, only Zhang and Feiock (2010) has been included in the dichotomy network because only this paper discusses the dichotomy in accordance with the design criterion adopted. The conclusion will comment on general tendencies in dichotomy research evident from 2011 to date.

Overall, then, for researchers interested in exploring conceptual and theoretical developments of the politics–administration dichotomy through journal papers for the period 1887–2010, the dichotomy network offers a map of the territory. The dichotomy network may orient interested scholars in different ways, and numerous explorations may be undertaken, depending on particular objectives. A handful of standard inquiries are common to citation networks. These not only offer useful information but also serve to contextualize whatever further, more particular explorations may be undertaken. They require the visualization of (1) certain top results, (2) the longitudinal development of the literature, (3) couplings, (4) co-citations, and (5) the main path traversing the network. These are the explorations to be pursued here, following an overview of the network itself.

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Overview of the Dichotomy Network

The dichotomy network is composed of 165 papers and 497 citation links (arcs). No pairs or groups of papers reference each other.

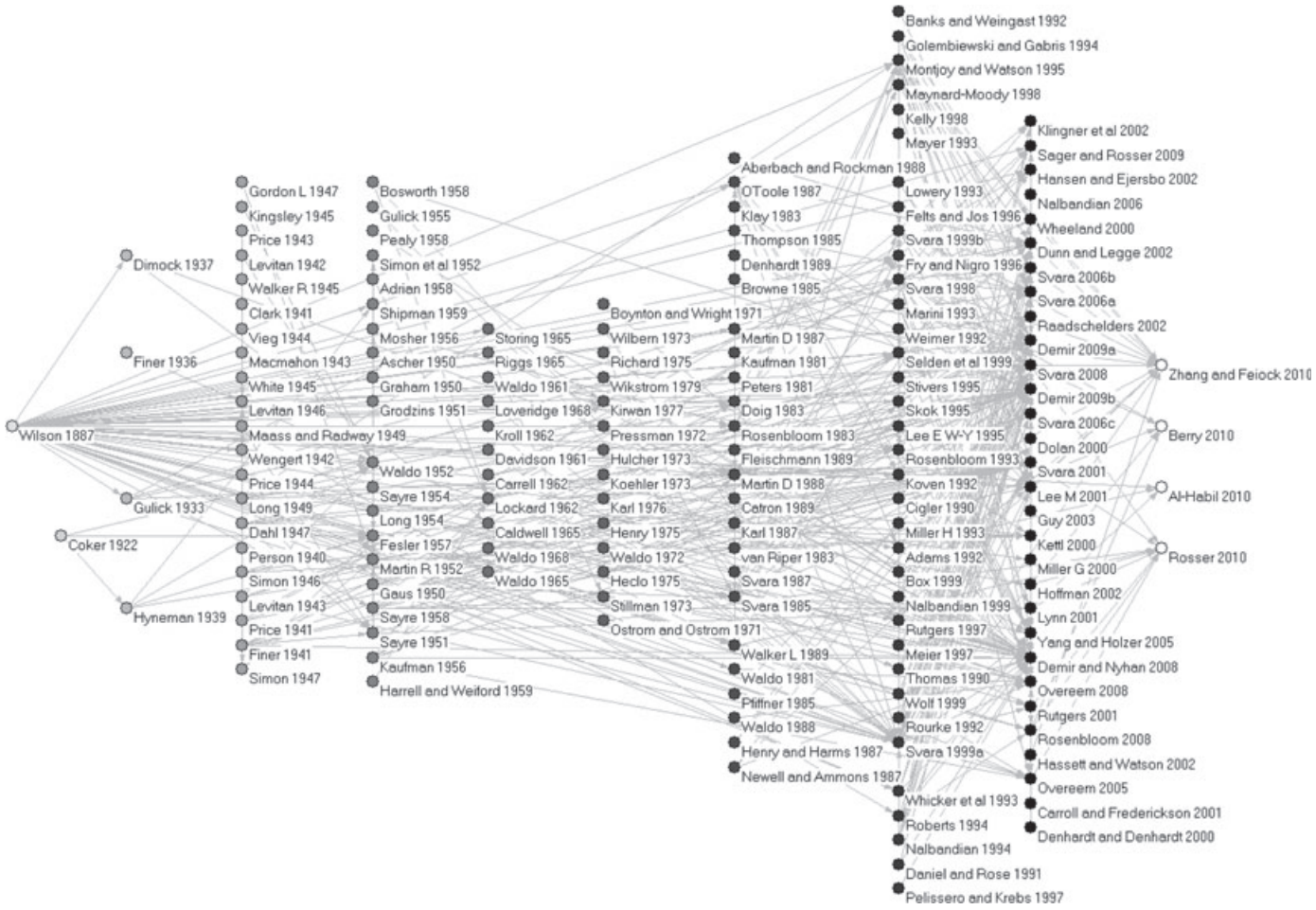


Figure 1 Dichotomy Network of 165 Papers and 497 Arcs

Year/Decade		1887	1920s	1930s	1940s	1950s	1960s	1970s	1980s	1990s	2000s	2010	Year/Decade Aggregate Outdegree Results		
	Papers published	1	1	4	21	20	11	14	24	35	30	4	Outdegree	Average Outdegree/Paper	% of network outdegrees
1887	1	0	0	2	1	5	2	3	9	10	18	1	51	51.00	10.26%
1920s	1		0	1	0	2	0	0	0	0	0	0	3	3.00	0.60%
1930s	4			0	1	3	1	1	2	2	2	0	12	3.00	2.41%
1940s	21				12	13	0	0	3	7	22	0	57	2.71	11.47%
1950s	20					12	4	2	4	10	25	0	57	2.85	11.47%
1960s	11						0	2	2	5	9	0	18	1.64	3.62%
1970s	14							0	3	3	18	2	26	1.86	5.23%
1980s	24								7	18	38	4	67	2.79	13.48%
1990s	35									14	106	9	129	3.69	25.96%
2000s	30										62	15	77	2.57	15.49%
2010	4											0	0	0.00	0.00%
Year/Decade Aggregate Indegree Results	Indegree	0	0	3	14	35	7	8	30	69	300	31			
	Average Indegree/ Paper	0.00	0.00	0.75	0.67	1.75	0.64	0.57	1.25	1.97	10.00	7.75			
	% of network indegrees	0.00%	0.00%	0.60%	2.82%	7.04%	1.41%	1.61%	6.04%	13.88%	60.36%	6.24%			

Total Papers	Total arcs
165	497

Figure 2 Adjacency Matrix of Dichotomy Network Using Papers Published by Decade

The network is shown in its entirety in figure 1, in which time moves from left to right and 160 papers are distributed across nine decades (1920s–2000s), flanked by Wilson's (1887) paper and four papers for 2010. The jump from Wilson's (1887) paper to the 1920s reflects a lack of literature meeting the design criterion of the network—a phenomenon discussed in more general terms by Van

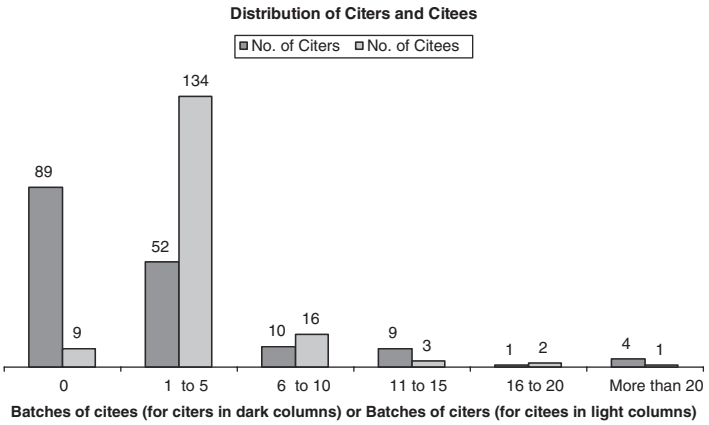


Figure 3 Distributions of Citers and Citees

Riper (1983) and Martin (1988). An interpretation of the trough evident in the 1960s and 1970s will be offered when discussing the network's longitudinal development.

Figure 2 shows aggregate results by decade, in what is known as an "adjacency matrix" (Harary, Norman, and Cartwright 1965, 14–18). Each row yields the aggregate outdegree results for—or, equally, the number of arcs originating from—a decade. Each column yields the aggregate indegree results for—or, equally, the number of arcs terminating at—a decade. Individual cells record similar information for pairings of decades. For example, in the 1950s, 20 papers were published. Reading across the representative row, these papers were cited a total of 57 times from the 1950s to the 2000s. Reading down the representative column, these same papers cited previous papers 35 times, of which 12 citations concerned papers from the 1950s. The asymmetric nature of the results reflects the directed nature of the network through its use of arcs. The 1990s is the most cited decade in the network, with an outdegree over a quarter of all others combined. The decade of the 2000s is the one that cites most, taking up more than 60 percent of all indegrees in the network. As will be discussed when examining some top results, the majority of the citations in these two decades reflect a resurgence in dichotomy research stemming from reconceptualizations of politics and administration as less dichotomous and more integrative or, at the very least, interactive along some continuum.

Of the 165 papers, 89 are not citers, while 9 are not citees. They are included in figure 3, which shows the distribution of citers per the number of citees referenced, as well as the distribution of citees per the number of referencing citers. The shape of these respective distributions is common in citation networks (Newman 2010, 248).

There are two reasons for the inclusion of nonciters. Some, for example, Wilson (1887) and Coker (1922), were published early on and so have no previous works to cite (within the network). Others, for example, Denhardt and Denhardt (2000) and Marini (1993), were published later but are not especially focused on the conceptual and theoretical issues pertaining to the dichotomy; they are, instead, cited further on in the network by citers who advance such issues. Nonciters generally cite Wilson (1887), and perhaps a couple more papers evident in the network, as a matter of course. Such links have not been included because the citations were not made in the interest of advancing theoretical or conceptual developments according to the design criterion of the network.

Analogous reasons are evidenced for the inclusion of noncitees. Some, for example, Demir (2009b) and Al-Habil (2010), were published too close to the network's upper temporal bound and so would not be expected to be cited in the network. Others, for example, Wengert (1942) and Shipman (1959), were published earlier but have been overlooked across the ensuing decades. Space precludes extended comment on these noncitees, but they are worth revisiting, either for statements of how the dichotomy was perceived during their times or for their attempts at opening new horizons to the debate. It is worth adding that other early papers are cited few times and usually only in passing. These are also worth revisiting. For example, Dimock (1937) draws detailed attention to Wilson's paper, while Finer (1936) comments on the dichotomy based on an extended critical review of the 12 monographs that resulted from the 1933 Commission of Inquiry on Public Service Personnel—a significant (and, for its time, authoritative) landmark in public administration.

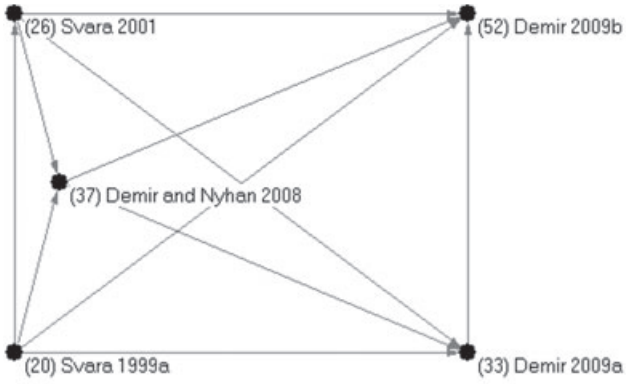
Top Results

Top Citers

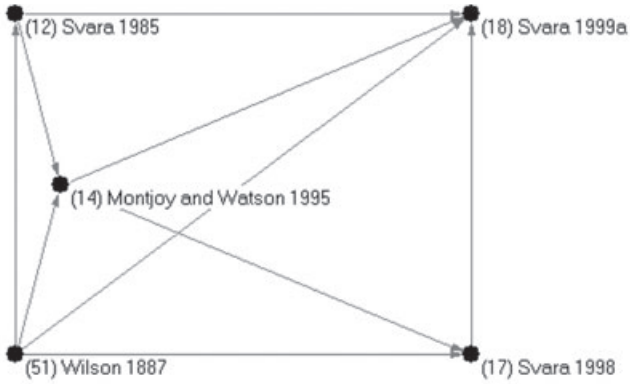
The top left of figure 4 shows the top five citers, the citation relationships between them, and their number of citees in brackets. The indegrees of the top five citers account for 34 percent of the citation links in the network. Structurally, the top five citers are interpretable as, at the very least, integrators of previous work and useful sources for getting a grip on the literature of the network. Examination of the papers themselves reveals that this is indeed the case. For instance, Svara (1999a), in arguing for a politics–administration complementarity, surveys the literature prior to the 1960s. The complementarity theme is central to two of the other top citers, as they also plow through the extant literature to make their case: Svara (2001) offers a model of the interaction between politicians and administrators, while Demir (2009a) tests the limits of the complementarity view against empirical findings. Demir and Nyhan (2008), for their part, draw together an even greater volume of the literature in order to set a theoretical foundation for an empirical study aimed at evaluating the predictive capability of the dichotomy. It is Demir (2009b), however, with a distillation of the literature on the role of public administration in the governance process into three schools, who offers the single most integrative approach of the literature in the network.

Top Citees

The top right of figure 4 shows the top five citees, the citation relationships between them, and their number of citers in brackets. The outdegrees of the top five citees account for 23 percent of citation links in the network. The inclusion of Wilson (1887) in this category is expected, and his paper accounts for 10 of the 23 percentage points. What might be surprising, however, is that he is cited by only 51 of the other papers, or 31 percent of the network. The most attention has been paid to Wilson's paper in the period from 1980 to the 2000s, during which time he has been cited 37 times, accounting for 72.5 percent of his outdegrees. Moreover, during these three decades, the trend has been an increasing one: 9, 10, and 18 citations, respectively. However, the majority of these citations, 22 (60 percent), are mere nods of acknowledgment toward Wilson.



Top five citers, the citation relationships between them, and their number of citees in brackets



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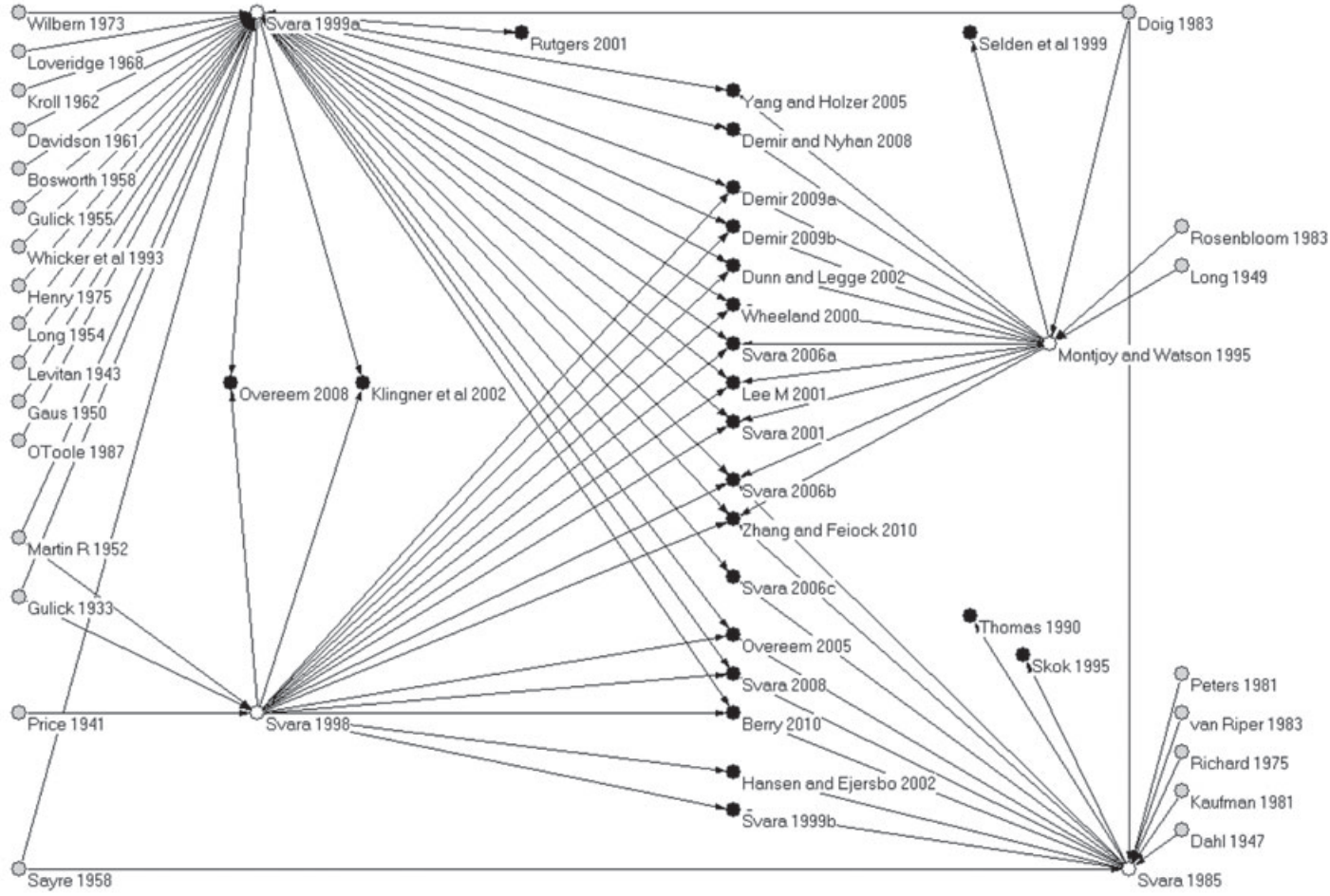


Four of the top citees (white), the papers they cite (gray), and the papers in which they are cited (black)

Figure 4 Top Citers and Citees

The remaining 15 offer varying degrees of hermeneutic analysis of Wilson's text, the most extensive of which have been undertaken by the other four top citees, as well as by Stillman (1973), Kirwan (1977), Doig (1983), Martin (1988), and Walker (1989). Overall, the figures lead to the following conclusion: although increasing citations to Wilson's paper have appeared since the 1980s, the great majority are not especially concerned with Wilson's views, indicating that, in the main, dichotomy research is moving on from its acknowledged starting marker.

Structurally, top citees are interpretable as, at the very least, providing the basic sources for studying issues surrounding the dichotomy. Rhetorically, they would usually be described as papers with "impact." This term, however, risks assuming too much, both in terms of the content of the citees as well as the context in which they are cited. "Utility" is perhaps a more reasonable descriptor, for, in essence, top citees reflect but foci of citers' research activity at any particular time. Examination of the four citees, other than Wilson, indeed reveals one such focus, and the century-long gap (composed

of 81 papers) between Wilson (1887) and the other four citees indicates its contemporaneity.

In sharp contrast to those papers constituting the gap, the four citees have spawned novel ways of viewing, critiquing, understanding, and examining the dichotomy, making for what may be termed a "revisionist" movement in dichotomy studies that triangulates between historical research, empirical observations, and the development of new models of interaction between politicians and administrators. This has been triggered by Svara's (1985) dichotomy-duality model from the mid-1980s, which enjoys the highest indegree and outdegree of its decade (8 and 12, respectively), as well as by his complementarity approach (Svara 1999a), which, similarly, enjoys the highest indegree and outdegree of the 1990s (20 and 18, respectively). All of the aforementioned top five citers refer to the revisionist tendency, as do 57 percent of the papers from the 2000s and two of the four papers from 2010.

It is worth putting this in perspective. Wilson (1887) is cited by 31 percent of the entire network. In addition, Dahl (1947), Finer (1941), Gaus (1950), Kaufman (1956), Long (1949), and Sayre (1958) enjoy the highest citation rates of the pre-1985 papers in the network (between 8 and 10 outdegrees each). Along with Wilson's paper, these six papers continue to command attention into the late 2000s, aggregately enjoying citations from 65 percent of the network. That is to say, the contemporary revisionist movement has managed, in the span of 20 years, to attract a degree of attention that is only 8 percentage points lower than that enjoyed by the core pre-1985 papers throughout the entire 123 years covered by the network. Even if Wilson (1887) is set aside and the earliest of the remaining papers—Finer (1941)—is used as the measurement base, the period is 69 years, one that is more than three times longer than that taken for the revisionist movement to attract a similar, and increasing, degree of attention. This indicates the presence of a momentum that could well continue throughout the 2010s. Five papers from the 1990s will probably be useful in maintaining this momentum: Svara (1998, 1999a, 1999b), Montjoy and Watson (1995), and Nalbandian (1994) account for half (more exactly, 64) of the 129 outdegrees of that decade.

The bottom of figure 4 offers a map through which the movement's evolution may be traced. The aforementioned four top citees are in white, the papers they cite in gray, and those in which they are cited in black. Arcs within each of these three groupings have been excluded in the interest of a clearer visual (as has Wilson, for the same reasons), and the relationships between papers within a group may be found in the figures that trace the longitudinal development of the network.

Top Journals

The five journals shown in figure 5 account for the greater majority of the papers composing the dichotomy network: 130 papers, or 78.8 percent of the network. *Public Administration Review* (*PAR*) accounts for 60 percent of the papers in the network. Of the top 10 combined citers and citees, six are published in this journal.

The position of *PAR* as the central forum for dichotomy debates is reinforced when considering the number of authors published therein. Indeed, examining the relationship between authors and journals enables a comparison of all 23 journals in the network. In the present case, this exploration is slightly simplified by treating coauthors of papers as single entities: for example, Boynton and Wright (1971) are considered as one author. As a result, there are 130 authors in the dichotomy network. In figure 6, the numbers in brackets indicate the number of authors published in any particular journal. For example, 82 authors (63 percent) in the dichotomy network are published in *PAR.* The sizes of the vertices are proportional to the number of associated authors. Line values beneath the edges between journals indicate the number of authors who are published in adjoining journals. For example, the edge between *PAR* and *American Political Science Review* has a line value of 2,

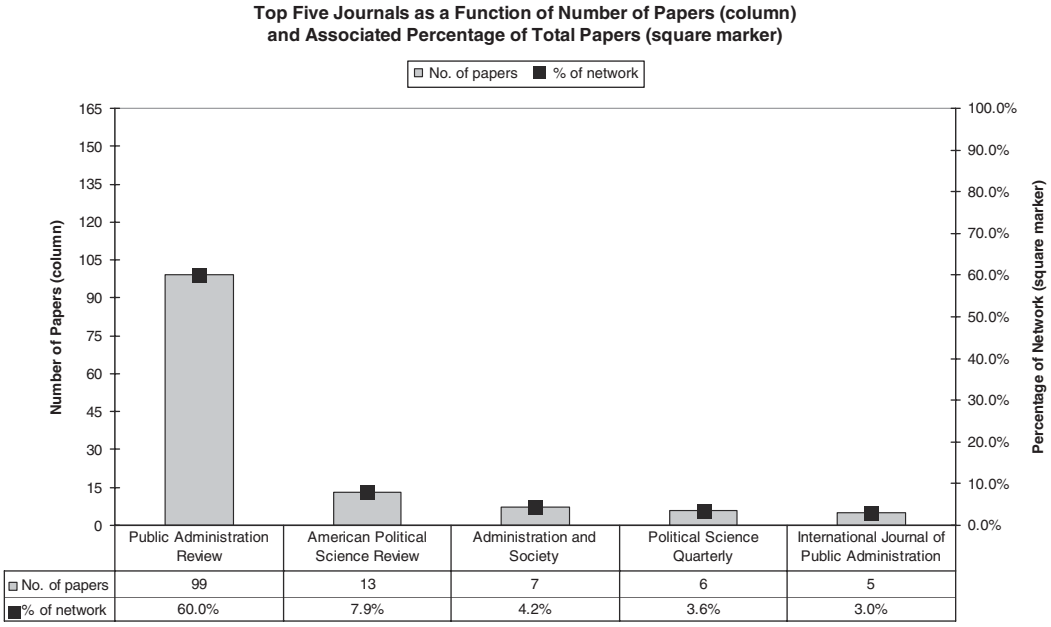


Figure 5 Top Five Journals by Quantity of Papers

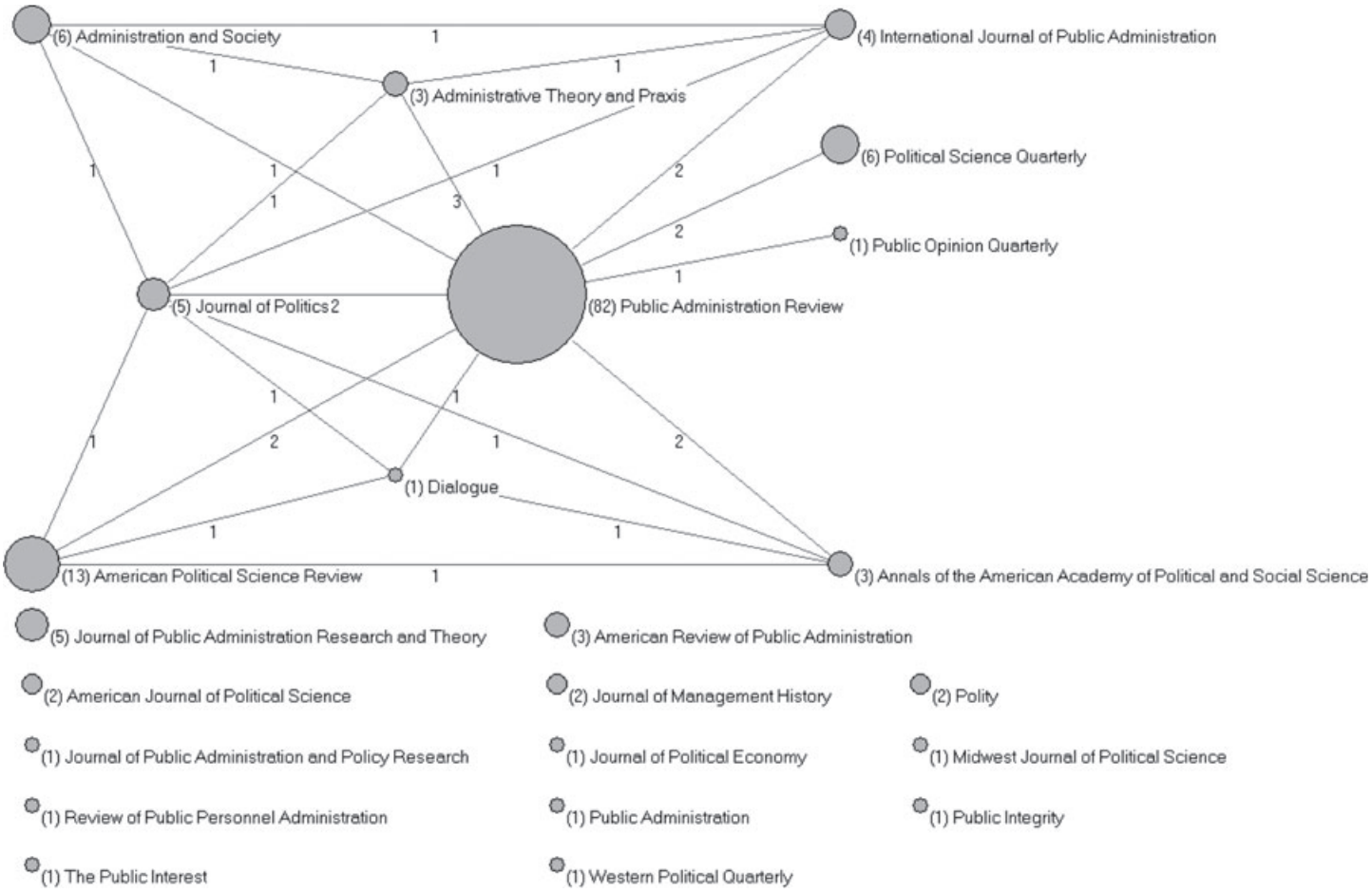


Figure 6 Journals Connected by Number of Common Authors (Line Value) with Brackets Indicating Number of Authors in Journal

indicating that two authors have published in both journals—in this case, Waldo and Kaufman. Isolated journals in the figure are those whose authors have not published in other journals in the network.

Whereas figure 5 reveals the number of papers in the top five journals, figure 6 can be used as a guide to the number of relevant authors one might expect to find in a particular journal and, of these, the number published in other journals. Figure 7 extends this information by identifying the authors involved; upon examination, it not only reinforces the central position of *PAR* but also reveals the low degree of author commonality among journals: only 10 authors (7.7 percent) have published their views on the dichotomy in more than one journal.

The dominance of *PAR* over the entire network, however, must be tempered against its evolutionary performance. Figure 8 traces the percentage of papers in the network published in *PAR* from its beginning in 1940 to the end of the 2000s (of the four papers from 2010, two are published in *PAR*). It is evident that while dichotomy research has enjoyed a resurgence since the 1980s, this resurgence has been spread across a number of journals, resulting in a declining percentage of papers published in *PAR.* Between the 1980s and 1990s, *PAR* suffered a 16.5 percent decrease in dichotomy papers, even as the total number published during this period increased by 45.8 percent. The decrease suffered by the journal between the 1990s and the 2000s is even more striking, 34.8 percent, although the total number published during this period decreased by only 14.3 percent. In the 2000s, furthermore, for the first time in its history, *PAR* published less than half of all the dichotomy papers.

Overall, since the 1980s, *PAR* has witnessed a 45.6 percent decrease of its share of dichotomy research, indicating a strong authorial tendency toward journal diversification. The main competing journals are the *International Journal of Public Administration, Administration & Society,* and *Journal of Public Administration Research and Theory.* It is noticeable that, despite such growth and diversification, journals affiliated with political science play a relatively minor role in dichotomy research. For example, since *Political Science Quarterly* republished Wilson's paper in 1941 (Brownlow 1956), only five papers have appeared in this journal that offer any contribution on the dichotomy (Finer 1936; Levitan 1946; Lockard 1962; Macmahon 1943; Walker 1989), and between them, they have been cited only nine times (to date 2010).

In general, from the 1940s until the end of the 1970s, political science journals published roughly a third of dichotomy research. Since then, their participation has been declining fast, down to less than 5 percent in the 2000s. This drastic downward tendency is paradoxical because it has been happening as theory and observation in dichotomy research have reinforced the need for greater integration in the roles of politicians and administrators. The 1960s may have been the "nasty" (Henry 1975, 381) time in the political science–public administration relationship (Waldo 1968), but with the

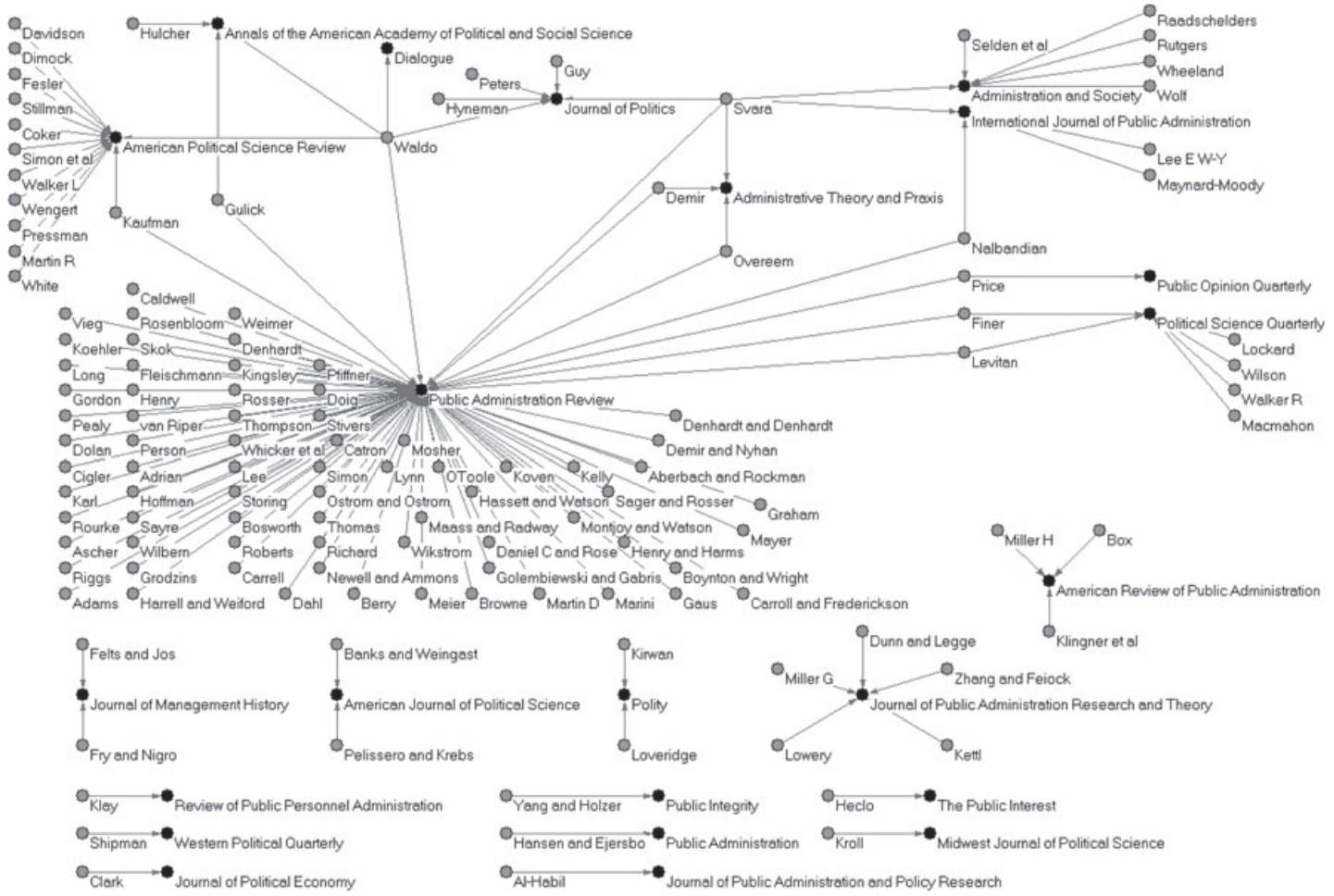


Figure 7 Journals and Their Authors

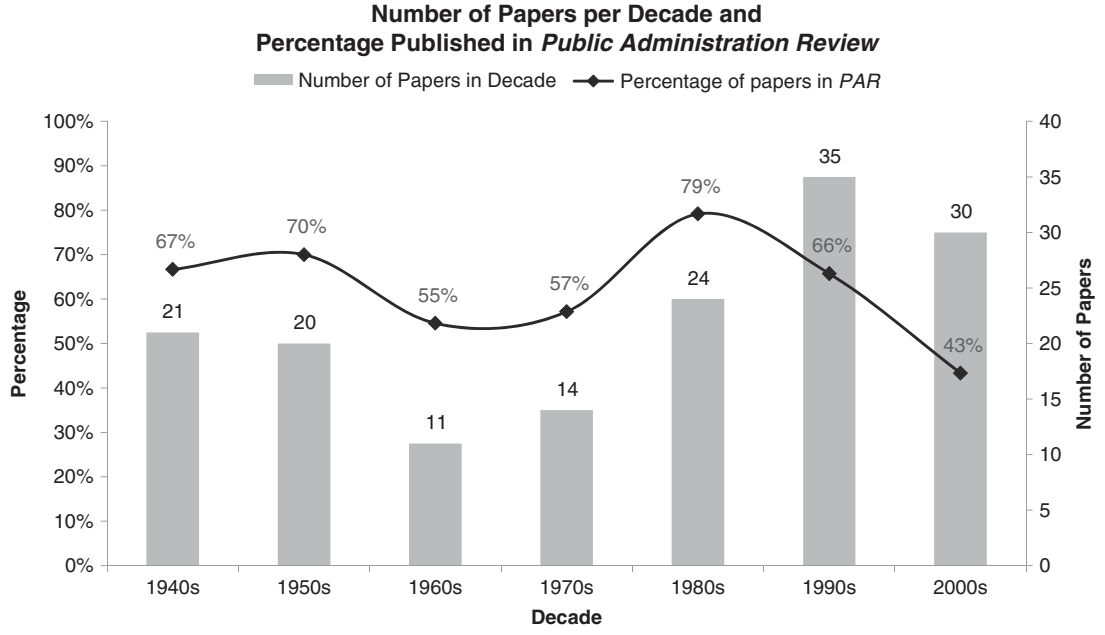


Figure 8 Evolution (Black Curve) of Percentage of Papers Published in *Public Administration Review*, 1940s–2000s

rise of the revisionist position, one would have expected greater participation from political science journals in the politics–administration debate. To date, there is little evidence for this, although wider issues in public administration are discussed by political science journals (examples in *Political Science Quarterly* include Brand [2008], Dickinson and Rudalevige [2004], and Harriger [2011]).

It remains to be seen whether political science journals will accept what is surely an open invitation to contribute to the discussion.

With the rise of the revisionist position, one would have expected greater participation from political science journals in the politics–administration debate.

Longitudinal Development

Examining the diagrams thus far, it is noticeable that particular vertices (for example, those of journals in figures 6 and 7) are positioned differently from one diagram to the next. As more information is included in networks, designing adequate visuals becomes increasingly challenging because of multiple line crossings. Network drawing is a relatively new computational field that is making some progress in the necessary algorithms that might optimize positioning and diagrammatic standardization for visuals (Di Battista et al. 1999). The challenge, however, is particularly acute for dynamically changing sets of drawings consisting of longitudinal visualizations of a network whose size is growing in time—which is the case here. Still, longitudinal visualizations offer panoramas that may guide historical research, literature reviews, and deep explorations into the territory. In offering them for the dichotomy network, the general convention followed has been to minimize line crossings. Although this causes some vertex positions to change between diagrams, requiring mental reorientation on the part of the user, it allows for diagrammatic clarity in any one visual.

Longitudinal visualizations of the dichotomy network are offered per decade, and particular conventions adopted for the drawings are as follows (supplemental figures can be found in the online version of this article):

- 1930s–80s (figures S1–S3): (1) a time convention, whereby time moves from left to right, with the citers of any particular decade toward the right; (2) a lineage tracing convention, whereby the citees used in any one decade are shown along with any connections between them; and (3) a shading convention for vertices according to their decade of publication, as used for the entire network in figure 1.
- 1990s (figure S4): the time convention is sacrificed; lineage and shading conventions are maintained.
- 2000s (figures S5–S7): the level of activity in this decade requires its division into three parts: 2000–3, 2004–7, and 2008–9; the time, lineage, and shading conventions are sacrificed; lineages can be traced using the visualizations of previous decades; papers of the 2000s are highlighted in black, with gray used for all other papers.
- 2010 (figure S8): as per the 2000s, with papers from 2010 in black.
- In all cases, any isolated vertices are grouped at the top and represent future citees published in that decade but whose own citation practices do not meet the design criterion of the network.

Because the utility of these maps is subject to the researcher's purposes, attention here is drawn to only a couple of particular points. For instance, the 1960s and 1970s are marked by a comparative lag in volume in theoretical dichotomy research. The relatively large quantities of isolated papers within these decades also indicate a time of dispersed research agendas. This is confirmed in the aggregate data of figure 2, which shows that papers published in these two decades neither reference each other nor fare favorably in outdegrees and indegrees across the network—although an increasing rate of citations is evident in later decades. At best, the questionable relevance of the dichotomy was noted in the 1960s, examples of which may be found in Caldwell (1965) and Riggs (1965), but there was no concerted effort to reconceptualize it, as happened from the mid-1980s onward. The 1970s, for their part, were marked by the rise of the "new" public administration (Waldo 1972), as well as of public choice (Ostrom and Ostrom 1971), neither of which directly contributed to advances in dichotomy research. On the other hand, a series of empirical studies during this decade (Heclo 1975; Hulcher 1973; Koehler 1973; Pressman 1972) began to indicate what Svara (1985, 1998, 1999a) would later theorize as a dichotomy-duality model and eventually develop into complementarity.

Mapping the 2000s shows that the decade closed with the top three citers of the network: Demir (2009a, 2009b) and Demir and Nyhan (2008) integrate a relatively large amount of previous material and contribute ways of thinking about the dichotomy. It is largely because of these three papers that the 2000s enjoy the largest aggregate indegree of the network.

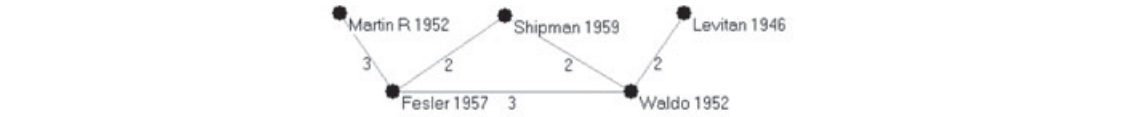
It is too soon to detect any particular tendencies for the 2010s, but, of the four papers in the year 2010, only one (Al-Habil 2010) cites Wilson (1887) as part of a wider discussion on the influence of scientific management on public administration. The other three offer a wide range of perspectives, and all situate the importance of the dichotomy within them: from the historical lineage of Wilson's administrative thought (Rosser 2010), to a call for new perspectives on the process of public administration (Berry 2010), to evidently changing roles of city managers while in office (Zhang and Feiock 2010). Time will tell how these will fare as citees during the 2010s.

Couplings

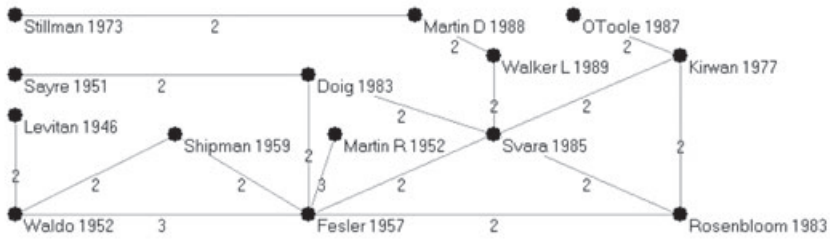
Couplings are pairings of citers based on the shared number of citees between them. The greater the number of citees shared between a pair of citers, the greater the structural indication that the pair of citers either share similar subject matter or are a useful combination for studying a particular line of reasoning or jointly integrate previous work.

In the dichotomy network, reasonable sizes of coupling subnetworks emerge only from the 1950s onward. Figure 9 shows the coupling subnetworks from the 1950s on a cumulative basis. Line values indicate the number of citees shared by a pair of citers. The thresholds for couplings have been set to two for the period 1950s–80s, to three for 1950s–90s and, for clearer visualization, to seven for 1950s–2000s and 1950s–2010. The maximum number of citees shared during each cumulative period is also recorded.

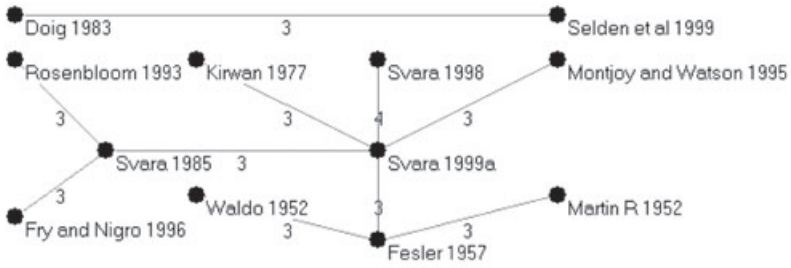
For the period 1950s–70s, the coupling subnetwork is the same. This reflects the aforementioned lag observed in research during the 1960s and 1970s. Until the 2000s, a maximum number of only four citees is shared between any two citers. From the 2000s onward, it jumps to 25, a result of the coupling of the two papers by



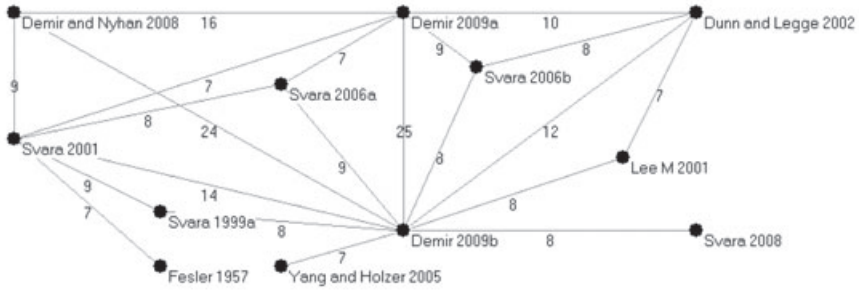
1950s-1970s (Citers with 2 or more citees in common; maximum common citees evidenced = 3)



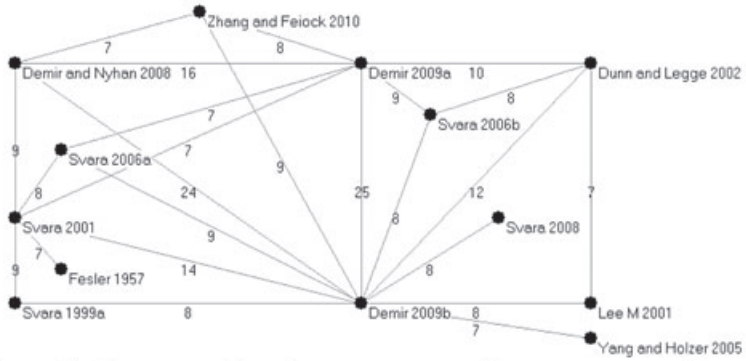
1950s-1980s (Citers with 2 or more citees in common; maximum common citees evidenced = 3)



1950s-1990s (Citers with 3 or more citees in common; maximum common citees evidenced = 4)



1950s-2000s (Citers with 7 or more citees in common; maximum common citees evidenced = 25)

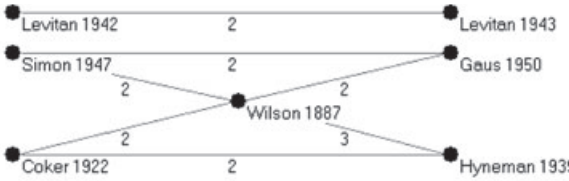


1950s-2010 (Citers with 7 or more citees in common; maximum common citees evidenced = 25)

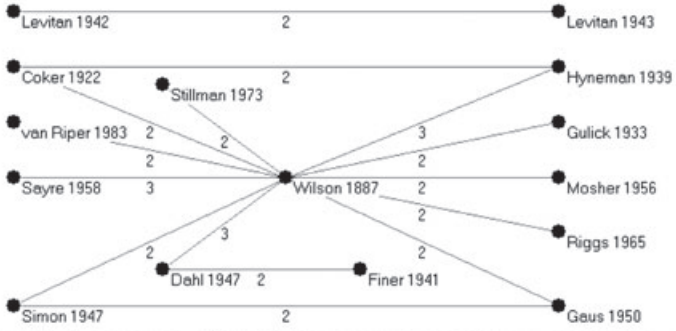
Figure 9 Couplings with Line Values Indicating Number of Citees Shared by Any Two Citers

Demir (2009a, 2009b). Even without this exceptional coupling, and excluding the exceptional 24 citees shared between Demir (2009b) and Demir and Nyhan (2008), the maximum number of citees shared between any two citers in the dichotomy network jumps to 14—more than a threefold increase from the previous half-century.

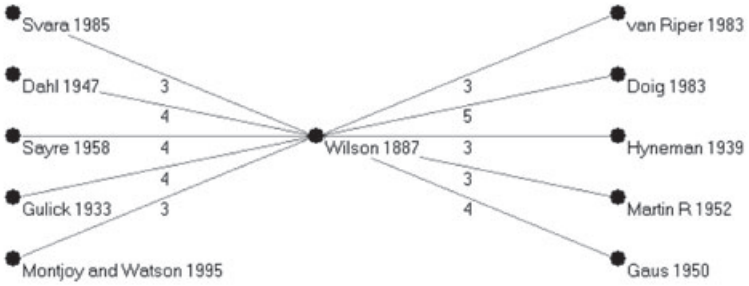
Coupling of existing citers cannot change over time because it is a function of citees already available. Notice, for example, that the only difference between the period 1950s–2000s and 1950s–2010 is that new citer couplings join the former couplings, these former remaining with unchanged line values. Also noticeable is the presence of all



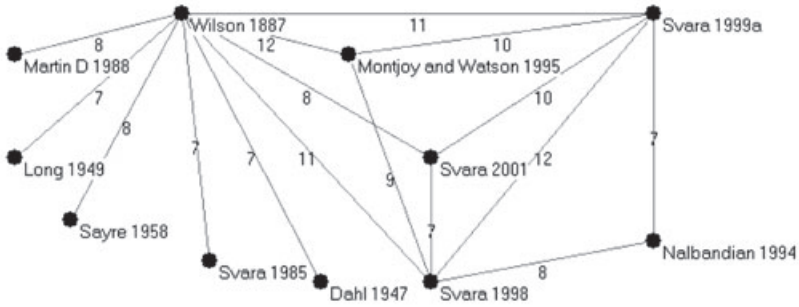
1950s-1970s (Citees with 2 or more citers in common; maximum common citers evidenced = 3)



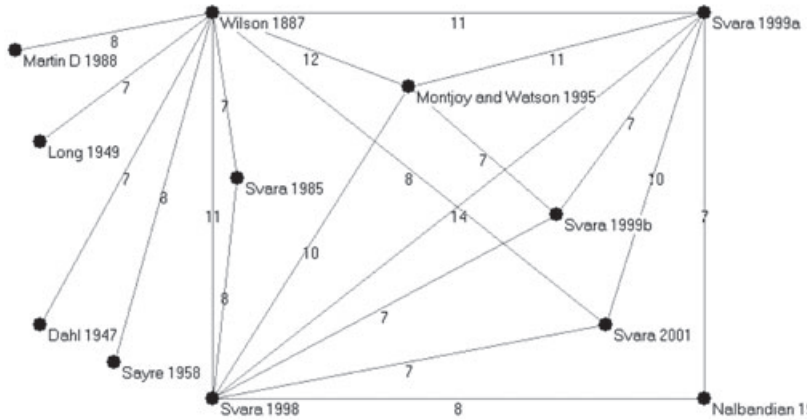
1950s-1980s (Citees with 2 or more citers in common; maximum common citers evidenced = 3)



1950s-1990s (Citees with 3 or more citers in common; maximum common citers evidenced = 5)



1950s-2000s (Citees with 7 or more citers in common; maximum common citers evidenced = 12)



1950s-2010 (Citees with 7 or more citers in common; maximum common citers evidenced = 14)

Figure 10 Co-Citations with Line Values Indicating Number of Citers Citing Any One Pair of Citees

five top citers in the last two coupling networks. Newman (2010, 117) notes that this is an observable phenomenon in citation networks because, as integrators of previous work, top citers have high indegrees, and therefore large bibliographies, with citees in common between them. Coupling scores can therefore serve as indicators of content similarity between two citers, allowing for an appreciation of their divergent or convergent interpretations of joint citees.

Co-Citations

Co-citations are pairings of citees based on the number of citers in which they are both cited. The greater the number of citers in which a pair of citees is to be found, the greater the structural indication that the pair either share a common intellectual interest, are a useful combination for pursuing a particular line of reasoning, or are jointly influential or useful. Care must be taken, however, in interpreting these results. For example, it could be argued that Wilson (1887) and Dimock (1937) share a common intellectual interest and pursue a similar line of reasoning, even if they are not in complete agreement. Yet, in the dichotomy network, only Martin (1988) ever considers them together, and even then very little by the way of detailed comparative analysis is offered. In other words, co-citations demonstrate a field's stipulated understanding of citee clusterings at a particular point in time but say nothing of potentially viable pairings. Longitudinal mappings of co-citations therefore add to an appreciation of a literature's dynamic changes.

Figure 10 shows the co-citation subnetworks from the 1950s onward on a cumulative basis. Line values indicate the number of citers sharing a pair of citees. In the interest of consistency, the thresholds for co-citations have been set equal to those for couplings. The maximum number of citers in which a pair of citees is found is also recorded for each cumulative period.

As evidenced with coupling, no co-citations of any reasonable size emerge prior to the 1950s, and there are no changes in co-citations for the period 1950s–70s. Until the 2000s, the maximum number of citers in which a citee pair appear is five. In the 2000s, this jumps to 12, and again to 14 in the year 2010.

Co-citation of two citees can increase over time as the pair receives new co-citations. In this respect, all increases in co-citations from the 2000s to 2010 involve four of the top five citees identified earlier (only Wilson [1887] stagnates). Structurally this is expected: Newman (2010, 117) notes an observable phenomenon in citation networks whereby there is a positive correlation between strong co-citation performance and respectively strong individual citation performance for any two papers in question. Moreover, it supports the earlier observation of a momentum in the literature that is taking account of the reinterpretations of the dichotomy and the complementarity approach. In this respect, the issue is not so much whether top citees enjoy high (and increasing) co-citations between them as the degree to which they do so in relation to other co-citees. Wilson's (1887) evident stagnation in co-citation scores—which encompasses his co-citations not only with top citees but also with more classical papers—might just be a blip. If it turns into a lag, this would indicate an increased sidelining of pre-1985 positions in favor of the movement begun by the other four top citees. Still, of the pre-1985 positions, the longitudinal tendency indicated by the co-citations is that, jointly with Wilson (1887), Dahl (1947), Sayre (1958), and Long (1949) remain as the most useful starting points for research.

Main Path

Of the 165 papers in the dichotomy network, which ones can be filtered into an initial reading list—ones, say, that can lay an adequate foundation from which informed steps can be taken into the remaining literature of the network? In other words, how can the network's 123 years of literature be spanned by, say, a dozen or so papers promising a substantial introduction to the rest?

Main path analysis offers an answer, and, as noted earlier, the variation known as search path count is used here. Its result is analogous to that piece of anatomy to which converges, and from which diverges, the nervous system: the spine. The procedure counts (1) all paths from each citee to each citer in the network and (2) the number of paths that include a particular citation link (that is, a particular arc). The latter divided by the former yields a "traversal weight" for any particular citation link, indicating the proportion of paths that use it. By counting the number of paths that include a particular paper, a traversal weight can also be assigned to papers, thus indicating the proportion of paths that pass through each of them. The sequence of papers with the highest traversal weights constitutes a path across a citation network, from its beginning to its end, hypothesized as representing the main stream, or backbone, of its constitutive literature.

The main path of the dichotomy network is composed of 19 papers, as shown in the main visual of figure 11. Numbers on arcs, or in square brackets next to vertices, indicate the proportion of all paths between citees and citers that include the citation link or paper, respectively. Vertex sizes correspond to the traversal weight of the vertex.

In figure 11, the main path calculations reveal Doig (1983) as an initial integrator of the previous 96 years of the literature, which is represented by Wilson (1887) and three of the handful of papers earlier identified as continuing to command the attention of dichotomy scholars. Doig's position on the main path, however, must be understood in context, especially because, in the earlier discussion of top citees, Stillman (1973) and Kirwan (1977) were identified as offering an integrative understanding of the past some years earlier. Indeed, one could argue that the only reason Doig shows up as initial integrator on the main path is not that he is cited by Svara (1985) but the latter also fails to cite the others. Although this is a correct conclusion to draw from the pure structure of the network, the position of Doig on the main path is also justifiable through an examination of the contents of the papers in question. Whereas Stillman and Kirwan focus heavily on interpreting Wilson, Doig extends the discussion to the context of public authorities. Because of this broader approach, the presence of Doig on the main path offers a logical means through which the revisionist movement—which is well represented in the main path—may be appreciated.

The path continues chronologically with three papers by Svara (1985, 1998, 1999a) and one by Montjoy and Watson (1995), reaching an intersection with Svara (2001). Looking ahead from this juncture, one could generalize that two incommensurable perspectives are about to develop: one through Yang and Holzer (2005)

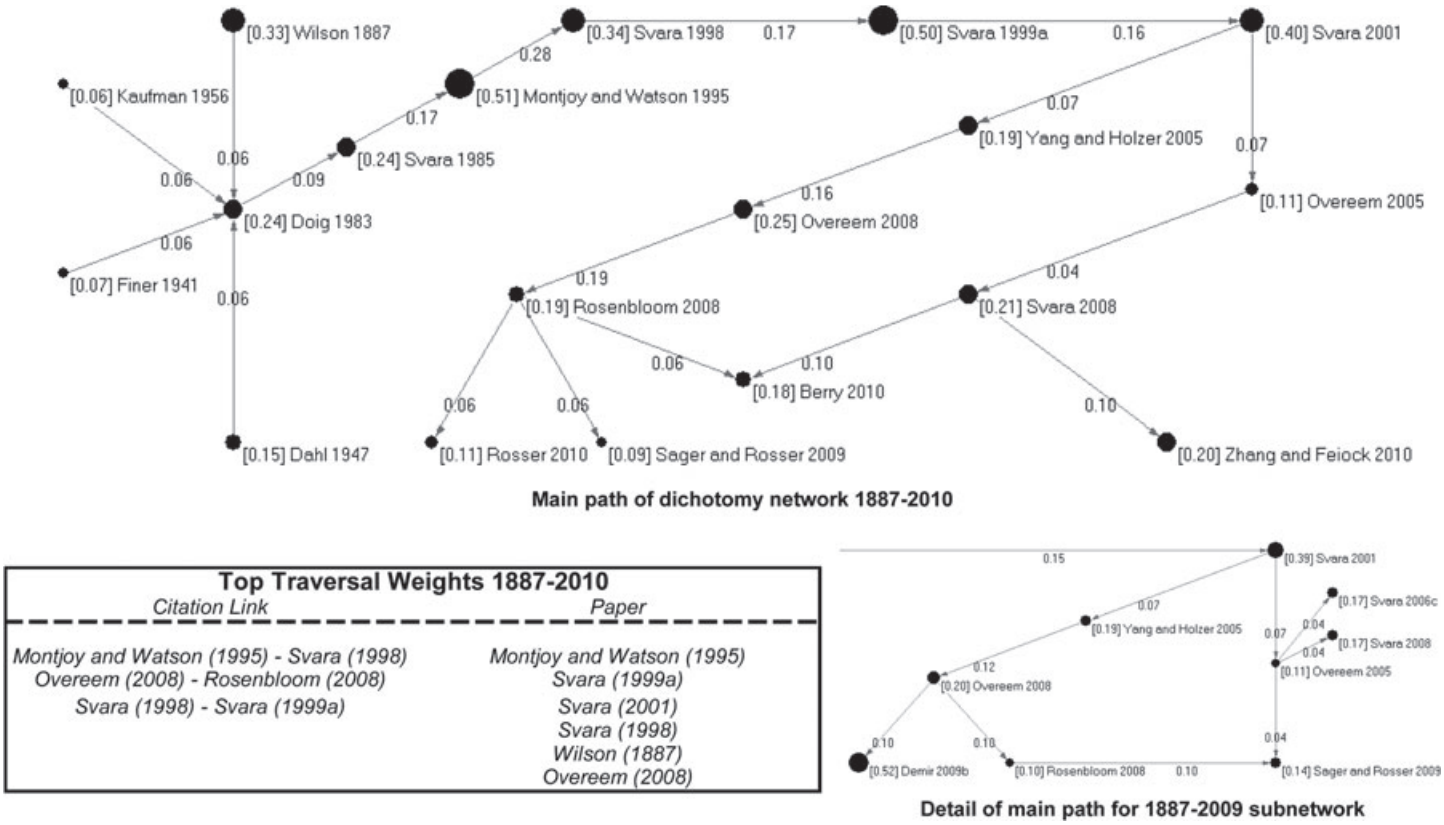


Figure 11 Main Path Analysis (Using Search Path Count Algorithm)

pursuing the much-discussed "demise" of the dichotomy and one through Overeem (2005) arguing for its continued relevance. To a certain extent, the diverging paths reflect these respective views, but the papers that constitute them cannot be classified so simply. Yang and Holzer (2005) rescue the dichotomy by arguing for its relevance in the field of administrative ethics. Overeem (2005), in turn, situates the dichotomy in issues of political neutrality. The former path gives rise to reexaminations of Waldo's writings (Overeem 2008; Rosenbloom 2008), from which emerge calls for less absolutist (Sager and Rosser 2009) and more comparative (Rosser 2010) perspectives on the dichotomy. The latter path pushes for studies into the intricate relationship (as opposed to separation) of politics and administration (Svara 2008) and is accompanied by supportive empirical evidence (Zhang and Feiock 2010). Both paths converge on Berry (2010), who promotes a more organic appreciation of public administration.

It may be questioned why the Demir (2009a, 2009b) and Demir and Nyhan (2008) papers are not shown in the main path. After all, figure 4 shows them to be the top three citers in the network. A main path, however, is built on junctions that span its entirety—in the present case, from 1887 to 2010. The citee status of the three Demir papers in the network is only that shown in figure 4: none is cited in 2010. In carving a path from beginning to end, therefore, the analysis has had to bypass them. When bringing forward the network's cut-off date to 2009, the main path remains structurally the same up to Svara (2001), although minor changes in traversal weights are evident. The changes at this junction are shown in the detail of figure 11. In this case, Demir (2009b) is the most salient of the endpoints, the path converges on Sager and Rosser (2009) and, because of these changes, the entire path is constituted by only 18 papers.

Finally, papers on a main path can be approached either as a group or according to subsets based on their associated ranked traversal weight. For the latter case, figure 11 shows the top six papers for 1887–2010 ranked according to link and paper traversal weights, respectively.

Conclusion

Since the 1980s, research has made sense of the politics–administration dichotomy by approaching it thematically, be it through historical appreciation, the division of the literature into "schools," empirical observation, or the development of new models of interaction between politicians and administrators. The contribution of this article is to approach the entire literature structurally, thus offering a high-level view of its development. The focus has been on theoretical and conceptual issues of the politics–administration dichotomy as debated in journal articles, for it is these types of issues that eventually guide practice, and their publication in journals reveals their scholarly relevance to the wider community of theorists and practitioners. The approach has yielded the following 10 structural results that can guide researchers through the literature:

The contribution of this article is to approach the entire literature structurally, thus offering a high-level view of its development.

1. An overall map and aggregate statistics per decade summarize the development of the literature from 1887 to 2010 (figures 1–2).
    - The lag between Wilson's (1887) paper and the 1920s reflects the absence discussed by Van Riper (1983) and Martin (1988).
    - Some decades emerge as more productive than others.
    - The 1990s is the most cited decade, while the 2000s is the decade that cites the most.
2. Respective distributions of citers and citees reveal the extent to which the former reference the latter (figure 3).
    - The shape of these distributions is in accordance with that observed in citation networks in general.
    - A couple of early articles (Dimock 1937; Finer 1936) that have been cited only a few times serve as examples of literature worth revisiting.
3. Top citers offer overviews and interpretations of the literature (figure 4).
    - The contexts within which such integrative exercises have occurred include the theoretical development of the complementarity perspective; models of interaction between politicians and administrators, as well as tests of the predictive capability of the dichotomy; empirical studies on complementarity; and the distillation of the literature on the role of public administration in the governance process into three schools.
4. Top citees promote views that have been deemed useful to the literature as it has grown (figure 4).
    - Four of the five top citees are characteristic of a strong momentum, triggered in the mid-1980s, regarding a complementarity perspective on the relationship between politics and administration.
    - Along with Wilson (1887), a group of six papers published prior to the mid-1980s continue to command the attention of dichotomy research.
5. Journal rankings, according to the quantity of their content, highlight the main forums of debate (figure 5), and an evolutionary tracing highlights an increasing diversification of journals that publish dichotomy research (figure 8).
    - *Public Administration Review* is aggregately dominant across the entire network, but this is tempered by its evidently declining volume of dichotomy research as authors have increasingly diversified into other journals since the mid-1980s.
6. Relating authors with journals simultaneously highlights the relationships between the latter (figures 6–7).
    - Few authors have shared their views in multiple journals.
7. Maps of the network's longitudinal development assist historical research and render explicit the manner in which the network has grown (figures S1–S8).
    - Reasons for adopting various drawing conventions have been noted.
    - There is a comparative lag in dichotomy research during the 1960s–70s.
    - The close of the 2000s is dominated (in citation terms) by three papers, all of which are top citers.
8. Couplings mapped cumulatively through time identify those citers with commonalities in their bibliographies who may be read jointly as means through which previous work may be understood (figure 9).
    - The presence of the top citers in more recent coupling networks agrees with the results expected of such networks.
    - Coupling scores serve as indicators of content similarity between two citers, allowing for an appreciation of their divergent or convergent interpretations of joint citees.
9. Co-citations mapped cumulatively through time identify those citees which citers have deemed useful as joint contributors to the literature (figure 10).
    - Research into complementarity has marked the co-citation networks from 2000 onward.
    - Presently, there is an initial indication of a sidelining of more classical positions.
    - Along with Wilson (1887), three papers published prior to the mid-1980s command joint attention.
10. The main path through the network identifies those papers that have codified previous work and been cited to a significant extent (figure 11).
    - Nineteen papers (11.5 percent) constitute an adequate initial reading list for getting to grips with the subject matter of the entire network.

Each result opens a point of entry into the literature and, together, they assist in the acquisition of a broad contextual understanding of the structure of the network. Upon such an understanding, further explorations may be designed. Such explorations can expand in two ways: either amplifying the network itself or scrutinizing it with advanced methods (or, eventually, both).

The network may be amplified by adding wider literature such as books, book reviews, dissertations, innumerable conference proceedings, unpublished manuscripts, published lectures, magazine articles, and perhaps even civil service internal reports. An international perspective could be incorporated. In this respect, Moreland's (1921) paper, being similar in content and purpose to that of Wilson, opens a path for exploring British scholarship. Easing the network's design criterion would allow for greater emphasis on empirical or related studies. It would be interesting to see how the results from an amplified network compare to those presented here. At the very least, an amplified network would begin to reveal the contextual position, within the wider literature, of the papers considered thus far. Amplification is also possible, however, by maintaining the network's current focus on journal papers and adding, in a timely fashion (say, every 10 years), new papers that meet its design criterion. A continuing longitudinal record for the same network could thus be maintained for new generations of researchers.

As to advanced analytical methods, the discussion has already indicated sources that offer variations for couplings, co-citations, and main path analyses, all of which serve as a basis for comparative results according to respectively different computational criteria. In general, network theory has been growing increasingly since the late 1990s with no letup on new approaches and results. Newman (2010) offers an extensive and detailed yet accessible introduction to the field, while Bang-Jensen and Gutin (2009) detail the mathematical theory and the algorithms relevant to networks composed of arcs. By no means all approaches are relevant to citation networks, and in this respect, Newman (2010, 67–72, 116–19, 169, 180–181, 222–61, 430, 487–99, 511, 534–39) and Jo et al. (2009) offer some ways forward. Furthermore, when applied to the dichotomy network, some yield results almost equivalent to those already uncovered here. For instance, De Nooy, Mrvar, and Batagelj (2011, 141–55) discuss a method for uncovering which high-outdegree citees are linked to which high-indegree citers. When this particular analysis is applied to the dichotomy network, the resulting top five vertices in each case are almost the same as those in figure 4, with two respective differences: in citers, Dunn and Legge (2002) substitutes for Svara (1999a), and in citees, Svara (2001) substitutes for Svara (1985).

Relatively easier analyses, however, are possible as stepping stones to advanced results. For example, the network could be partitioned into clusters in order to see the extent of the relationships between groups of articles in the literature (De Nooy, Mrvar, and Batagelj 2011, 34–61). Overeem's (2012, 1–18) considerations of the dichotomy reveal possible categorizations in this respect, such as rejectionists, standard accounts, defenders, empirical studies, and ancestral papers, among others. Other categorizations may be deduced from the combined discussions to be found in the aforementioned top citers.

One recurring theme throughout the explorations has been the momentum instigated by Svara's (1985, 1998, 1999a) complementarity perspective, a momentum that might well continue into the 2010s. Indeed, papers (outside the temporal upper bound of the network) have already appeared that further contribute to this integrative understanding of the relationship between politicians and administrators (Demir and Nank 2012; Demir and Reddick 2012). Complementarity, however, cannot ignore what other authors are finding, namely, the need for some institutionalized dichotomy that can either serve to control/minimize corruption (Dahlstrom, Lapuente, and Teorell 2012) or manage government contracting, which, though openly advocated on grounds of technical efficiency, is not exempt from political meddling (Witko 2011). A relatively new literature is also emerging that seeks to examine the nature and relevance of the dichotomy in developing regions (Ayee 2013; Gulrajani and Moloney 2011). And, perhaps unsurprisingly, the historical roots of the politics–administration dichotomy continue to attract debate (Gultekin 2011; Sakli 2013; Uwizeyimana 2013), no less because of the perennial question of the relationship between efficiency and democracy (Al-Habil 2011). With such a variety of issues raised in the first few years of the 2010s, the decade promises to be as busy as ever with dichotomy research.

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SUPPORTING INFORMATION

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Figure S1 1930s–1950s

Figure S2 1960s–1970s

Figure S3 1980s

Figure S4 1990s

Figure S5 2000–2003

Figure S6 2004–2007

Figure S7 2008–2009

Figure S8 2010