

PARALLEL, TRANSFER OR COLLABORATION STRATEGY OF RELATING THEORY TO PRACTICE? A CASE STUDY OF PUBLIC MANAGEMENT DEBATE IN GERMANY

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The relationship between theory and practice is essential to 'applied sciences' such as public management. However, the current debate on this topic lacks empirical substantiation. Here I develop a methodology for the indication of how the theory-practice gap is actually addressed in a given subfield of management enquiry. I distinguish three archetypal strategies of relating theory to practice and develop several bibliometric indicators for them. Subsequently, I apply this methodology in a case study on the German public management debate from 1989 to 2005, a study based on bibliometric data of some 900 articles on public management. As will be demonstrated, in Germany, the theory-practice divide is predominantly framed as a problem of knowledge transfer between scholars and practitioners. Reflections on the institutional structures of public management in Germany make it clear why the transfer strategy is chosen, thus proving the validity of the suggested indicators.

INTRODUCTION

In a debate in the field of public management and policy, endeavours are being made to determine the relationship between the academic discipline and the practical domain it is dedicated to. This discussion is by no means limited to administrative science. It represents a deep controversy in management and organization studies, leading to a reflective phase which has been referred to by some commentators as a 'period of introspection' (Walsh *et al.* 2006). The matter of dispute is how to bridge the gap between theory and practice. More precisely, is how, and if at all, knowledge can be produced which is both rigorous in terms of epistemological and methodological stringency and relevant with regard to its applicability and usefulness in practice (Rynes *et al.* 2001; Starkey and Madan 2001; Bennis and O'Toole 2005; Rynes and Shapiro 2005; Huff *et al.* 2006; Rousseau 2006; Van de Ven and Johnson 2006; Cummings 2007; Rynes 2007; Shapiro *et al.* 2007; Walsh *et al.* 2007). In terms of public policy and management, commentators seem to largely agree on two points. Firstly, that the factual influence of the discipline on issues of public interest is negligible, in spite of the potential contributions management-organizational research could make to the many intractable problems society is faced with (Meier and Keiser 1996; O'Toole 2004; Pettigrew 2005; Rynes and Shapiro 2005). Secondly, that a greater engagement in and impact on such issues, according to the needs of knowledge users in management practice, is desirable (Adler and Jermier 2005; Barney 2005; Dodge *et al.* 2005; Druskat 2005; Dutton 2005; Hitt 2005; Ospina and Dodge 2005; Vermeulen 2005; Barzelay and Thompson 2007).

However, the ways in which these advances can be made are not as clear. Van de Ven and Johnson have distinguished between three strategies for addressing the theory-practice gap (Van de Ven and Johnson 2006; Van de Ven 2007):

1. that scholarly and practical knowledge can be parallelized in order to supplement one other, without levelling the differences of both ways of knowing;

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2. that attempts can be made to enhance the knowledge transfer from scholars to practitioners, making academic knowledge better understandable and applicable for its users in practical domains;
3. that a collaboration strategy can be pursued, giving rise to boundary-spanning communities consisting both of scholars and practitioners who are engaged in joint knowledge production.

While a confusing number of opinions exist regarding which of these strategies the framing of the theory-practice relationship should be aligned with, there is still little information on how the theory-practice relationship is actually framed. The current debate is normatively charged and lacks empirical substantiation. It would thus greatly benefit from descriptive examinations of the theory-practice relationship. In this article, I aim to make such a contribution. For this purpose, I draw on the Van de Ven and Johnson framework which has the merit of differentiating empirical manifestations of how theory and practice can archetypally relate to each other. However, there are still insufficient details in the framework with regard to observable indicators of which strategy of the three outlined above is actually implemented in a given subfield of management research and practice. In order to address this deficit, I develop a set of measures, outlined below, which serves as an index of how prevalent the parallel, transfer or collaboration strategies are in management debates. This methodology allows us to examine the strategies of bridging theory and practice in a descriptive manner and thus helps to underpin the debate with empirical information. Going one step further, I apply the methodology to a national subfield of public management – the public management debate in Germany – in order to prove the validity of the developed indicators in a case study design. In addition, with this case study, I continue a series of status reports on administrative sciences in Europe published in *Public Administration*, including those on Germany (see Benz 2005; Bogumil 2005). My particular emphasis is on the linkages to administrative practice.

For these purposes, I address the theory-practice tie essentially as a communication relationship. In this view, the three devices of relating theory to practice represent different types of communication strategies. Communication is the transfer of information from a source to a recipient (Shannon and Weaver 1949). In scientific inquiry, communication is of the utmost importance, perhaps best expressed in a famous quotation of Derek de Solla Price who claimed that ‘science is not science that communication lacks’ (de Solla Price 1965, p. 58). Scientific communication can be roughly divided into two kinds: formal and informal (Griffith 1990; Ding 1998a). The importance of informal communication (in personal conversations, in presentations at conferences, in laboratory protocols, and so on) should not be underestimated. Formal communication, however, via publication, has paramount significance for three reasons. Firstly, by publication in journals, books, reports, and so on, knowledge becomes publicly accessible and thus serves the communitarian endeavour of science. Secondly, by publishing, the originators of knowledge claim their rights in terms of intellectual property. Thirdly, the publication system plays a major role in allocating reputation and thus in stratifying the scientific community.

Bibliometrics, that part of statistical informetrics which deals with the measurement of texts, represents a quantitative approach which draws on formal scholarly communication via official publications (Ding 1998a, b). It aggregates and reorganizes freely accessible bibliographical information which is contained in (scientific) publications and thereby detects macro-patterns of communication in the discourse under investigation. The most important application of bibliometrics is citation analysis, which is used to

trace relationships between print publications, thereby revealing the social and cognitive structures of scientific disciplines (for an introduction, see Leydesdorff 2001). Recently, these techniques have gained some prominence in various disciplines, including management research (Acedo *et al.* 2006a, b; Bergh *et al.* 2006; Conlon *et al.* 2006; Golden-Biddle *et al.* 2006; Colquitt and Zapata-Phelan 2007; Ilgen 2007; Judge *et al.* 2007; Nag *et al.* 2007; Newbert 2007). Since this study is the first of its kind to use bibliometric analysis to examine the relationship between theory and practice within the field of public management, it provides a new approach to public administration.

The remainder of this article is organized as follows. I first introduce in more detail the three strategies outlined above. I then go on to suggest three bibliometric indicators of these strategies, providing a methodology for examining their prevalence in management-related debates. The case study is then presented, starting with a dense description of the case setting, that is, the institutional structure of German public administration, in general, and public management more specifically. Then follows information about data and method, together with a presentation of the results of the bibliometric analysis, comprising both descriptive statistics and more complex multivariate analysis. In the section that follows, the results are discussed in order to assess if the bibliometric indications can be confirmed in a more interpretive fashion. The article concludes with some remarks on the relevance of the findings for the debate on the theory-practice divide and beyond it.

STRATEGIES OF RELATING THEORY TO PRACTICE

Much has been written on the theory-practice gap and how it can be overcome to balance rigour and relevance of research knowledge. The relationship between theory and practice is of persistent importance to many scientific disciplines, but in the field of management it has always received special attention. As outlined in the introduction above, Van de Ven and Johnson, in an overview of the literature, examine three approaches by which the proclaimed contradiction of theory and practice could be resolved (Van de Ven and Johnson 2006; Van de Ven 2007). In what follows, I first describe the content of these strategies and summarize them by highlighting the distinctive communication models they rest on. In step two, I develop some (non-exhaustive) bibliometric descriptors of these models which indicate strategy implementation in a given field of management research and practice. These indicators draw on the most important medium of formal communication and preferential unit of analysis in bibliometrics, that is, journal articles.

Strategy contents

Parallel strategy

I call the first strategy of relating theory to practice parallel strategy. Proponents of this strategy negate the possibility of deriving practical knowledge from theories. For them, theory and practice represent distinct domains of knowledge, each in its own right. Each is based on a different ontology as well as epistemology. For this reason, practical knowledge cannot be seen as underprivileged and subordinated to theoretical knowledge, but simply as a distinct form of knowing. Scholarly and managerial work differs in their contexts, processes and purposes. The purpose of practical knowledge is how to do things in a particular situation, whereas theoretical knowledge aims at viewing a specific situation as an instance of general principles. The quest for customization and experience-driven problem solving on the one hand and the claim for generalization and

rule-based reasoning on the other drive apart both domains. However, appreciating the distinctiveness of theoretical and practical knowledge does not mean that both ways of knowing stand in opposition to each other or can be mutually substituted. Rather, there is a complementary relationship between both. The hurdles of rigour and relevance cannot be met by the same kind of knowledge; thus a duality of theoretical and practical knowledge is inevitable. Hence, proponents of the parallel strategy argue for maintaining management studies as an autonomous communication system (Grey 2001; Kilduff and Kelemen 2001; Weick 2001; Nicolai 2004; Pfeffer and Fong 2004; Kieser and Nicolai 2005; McKelvey 2006).

Transfer strategy

The second strategy frames the theory-practice problem as one of translating and diffusing research knowledge into management practice. From this perspective, scholarly knowledge does not, in principle, lack relevance for practice. However, in the way it is communicated among scholars, it is barely understandable for practitioners. This can best be seen by the low proportion of managers among the readers of academic journals. Scholarly knowledge typically has a form that cannot be readily applied in practice, and scholars have little incentive to specify how their knowledge can be implemented in management settings. Thus, according to this view of the theory-practice problem, the relevance of research output can be enhanced by complementing the knowledge supply chain from theory to practice with enriched distribution channels. In this approach, attempts to narrow the theory-practice gap give rise to greater efforts of popularizing research knowledge. This strategy of improved knowledge transfer is also discussed in public management and policy. Dutton (2005) calls for innovative ways of disseminating applicable knowledge for the pressing short-term or enduring long-term questions public policy is facing, and Hitt (2005, p. 965) believes that management scholars should communicate the implications of their work 'not only in their scholarly articles but also through articles designed to translate their work for managers and public policy makers'. However, for Pettigrew (2005), this approach falls short because knowledge users have no influence on the content of the knowledge offered by scholars.

Collaboration strategy

In this approach, the antagonism of theory and practice is a problem of knowledge production rather than one of knowledge transfer or, as Shapiro and colleagues (2007) refer to it, a 'lost before' rather than a 'lost in' translation problem. Adherents of this position emphasize that the theory-practice problem not only occurs after the completion of knowledge production, but is relevant during the whole production process, starting with the specification of the research question (Amabile *et al.* 2001; Calori 2002; Van de Ven and Johnson 2006; Gulati 2007). Instead of institutional reforms such as modifications in editorial policies and review procedures, funding criteria, academic tenure and reward systems, it centres on individual activities of scientists and calls for intensified communication with practitioners both before and during the process of knowledge generation. As Van de Ven and Johnson (2006, p. 809) put it:

Engagement is a relationship that involves negotiation and collaboration between researchers and practitioners in a learning community; such a community jointly produces knowledge that can both advance the scientific enterprise and enlighten a community of practitioners.

The collaboration strategy draws on the idea of intellectual arbitrage between different professional areas and thus represents a dialectic method of inquiry which includes the design, conduct and implementation of a research programme. Participation in boundary-spanning research groups, composed of pragmatic researchers and reflective practitioners, requires high personal skills to handle the various knowledge contributions of the network members.

Although some debaters generally favour one strategy over the others, a one-strategy-fits-all approach is not sensitive to the different purposes scientific knowledge may serve. Roughly speaking, scientific statements can be descriptive, explanatory and/or prescriptive. While descriptive and explanatory kinds of knowledge are usually highly relevant for academicians, they are of less interest to practitioners who seek more explicit advice on how to improve practice. Therefore, for this kind of knowledge, the parallel strategy is more appropriate than the other strategies. Conversely, prescriptive statements usually meet the demand of practitioners for design-oriented knowledge, while they are less interesting for academicians who are not under pressure to act. In this case, the transfer and collaboration strategy fit better. They are also advantageous when knowledge both serves academic (that is, descriptive and/or explanatory) and practical (that is, prescriptive) purposes, as is often the case in 'applied sciences' such as public management. That is to say, that when these strategies prevail, knowledge is both targeted to the needs of academicians and practitioners. Thus, the choice of an appropriate strategy must be made case-by-case and largely depends on the intentions of the scientific statements involved.

Approaching the three strategies of dealing with the theory-practice gap in terms of communication relationships, they represent differentiable types of information flows. These are schematically displayed in figure 1. To simplify matters, the communication is depicted as unidirectional, linear transmission proceeding from emissaries to recipients. In reality, the information can, of course, flow back if the roles of sources and receivers switch. When the parallel strategy is implemented, scholars communicate with one another exclusively – as do practitioners. This does not rule out the possibility that communication occurs among scholars and practitioners – and thus that they will have a reciprocal influence on each other; there is, however, little direct cross-professional communication. Thus the communication channels remain largely separate. In contrast, when the transfer strategy is implemented, scholars do not communicate with peers alone, but also with practitioners. In order to reach both groups of recipients, they choose different information transmitters. Two independent and different communication relationships evolve. The same holds true for the collaboration strategy, but here scholars

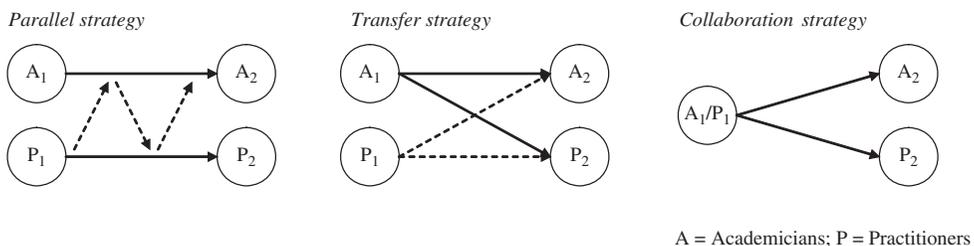


FIGURE 1 *Types of communication according to different strategies.*

and practitioners jointly provide the source of information. They engage in boundary-spanning teams which produce knowledge of both scientific and practical significance. Based on these different types of communication, representing the parallel, transfer and collaboration strategy, in the section that follows I deduce how these strategies can be indicated by means of bibliometric measures.

Strategy indicators

As outlined in the introduction, due to its supreme importance for scientific endeavour, the research design of this study draws on formal scholarly communication. Thus the objects of analysis are formal documents (that is, journal articles) written by scholars in order to disseminate the results of their research. There are practical reasons for such a research design. Through its transparency, the publication system commonly offers the researcher better data access than informal communication. Knowledge becomes tangible when it takes the form of a formal publication. Given these conditions of retrieval, a comparatively large amount of data can be processed when the analysis rests on publications as transmitters of information. However, bibliometric methods represent only one possibility of conducting empirical research on formal publications. As with any scientific method, they have strengths and weaknesses, too. One of the general limitations of bibliometrics is the lack of its hermeneutic capability due to its strict quantitative orientation. Using quantitative measures of its bibliographic characteristics, the content of a publication can only be approximately captured. Thus quantitative methods (such as bibliometrics) and qualitative methods (such as content analysis) supplement rather than substitute each other. Because of the undoubted advantage bibliometric methods offer in reducing complexity via statistical methods, to a digestible amount, it is worthwhile sticking to these methods when dealing with the issue under discussion. In the 'publish or perish' culture of contemporary science, it is becoming progressively difficult to keep track of the fast-growing number of publications. In the face of this overload of information, bibliometric methods are capable of indicating patterns of communication which would remain intangible by other methods. I now go on to suggest some highly aggregated bibliometric indicators which help to identify the strategies under discussion in empirical settings.

Collaboration intensity

Since the collaboration strategy (unlike the other strategies) rests on the cross-boundary teamwork of scholars and practitioners, the indication of collaboration intensity must be of primary concern here. A high intensity of collaboration indicates – logically – that the collaboration strategy is being used; a low intensity of collaboration would point to one of the other two strategies, because neither the transfer nor the parallel strategy rests on a collaborative mode of knowledge generation. Co-authorship is a standard bibliometric measure for indicating collaboration in scientific communication (Wagner-Dobler 2001; Glanzel 2002; Glanzel and Schubert 2004). It is frequently used to analyse the overall intensity of collaboration in a given field, for example, in terms of the average number of authors per paper, the share of co-authored papers in the total number of publications, or the average team size of author collectives. Furthermore, co-authorship is measured in order to analyse patterns of collaboration between persons (for example, Yin *et al.* 2006), groups (for example, Laudel 2002), departments (for example, Mahlck and Persson 2000), organizations (for example, Rodriguez *et al.* 2007), regions (for example, Wang *et al.* 2005), nations (for example, Abt 2007) and sectors (for example, Lundberg *et al.* 2006). In most

of these cases, the analysis is based on information extracted from biographical notes in journal articles about authors' institutional affiliations. Of course, as a descriptor of collaboration, co-authorship is of limited meaning. Neither have all the people who appear as a paper's co-authors actually taken part in the collaboration, nor do all collaborators necessarily become co-authors (Melin and Persson 1996; Katz and Martin 1997; Laudel 2002; Lundberg *et al.* 2006). Hence, co-authorship is only an approximation to actual collaboration.

Journal exclusivity

Although the second indicator to be used in this study, journal exclusivity, has not been processed in research thus far, some contributions to the theory-practice debate relate directly to it. As outlined above, one important issue in this debate concerns the distribution channels of academic knowledge. What is especially discussed in this respect are application-oriented 'bridge journals', a term that covers intermediate publications which are, although written by scholars, directed at practitioners (Cascio 2007; Cohen 2007; Guest 2007; Gulati 2007; Lawler 2007; Rynes *et al.* 2007; Saari 2007; Vermeulen 2007). By publishing in journals of this type, scholars and practitioners partly use the same messengers. However, it is highly likely that academics will only submit their papers to those particular journals if they aim to reach practitioners – despite incentive-related constraints resulting from the relatively low prestige and rank of these media. This holds true both for the transfer and collaboration strategy, while a distinguishing feature of the parallel strategy is exclusive communication among peers. Thus, journal exclusivity, in terms of the degree to which application-oriented periodicals cover articles (co-) written by scholars, can be reported as a descriptor with the power to discriminate between the parallel strategy and the two other strategies. Journal exclusivity – which might just as well be referred to as 'author homogeneity' – is high (low) if the share of papers written by authors who deviate from the sectoral affiliations of the targeted readers is low (high). The reason why this indicator has not been systematically used hitherto is that the most common bibliographic databases only document high-ranking academic journals while broadly excluding practitioner-oriented publication outlets. In contrast, the case study presented below rests on a database which covers both journal types and thus allows for processing this indicator.

Article differences

In order to assess which of the bridging strategies prevails in a management discourse, it is interesting to note not only which media scholarly articles appear in, but also how they are written. If information is intended to reach its recipients, the way information is coded is just as important as the communication channel chosen for its transfer. Part of the perceived theory-practice divide is that scholars 'typically do not write in a style that motivates practitioners to read their articles' and even 'talk in code to practitioners' (Cohen 2007, pp. 1015, 1017). Since practitioners have different information needs to those of scholars, the information must assume a shape appropriate to the target group in order to reach them straightforwardly. The resolution of this translation problem is at heart of the transfer strategy which aims to overcome the scholar's inability and perhaps unwillingness to translate their findings for practitioners and to foster a kind of bilingualism (Bartunek 2007; Latham 2007; Shapiro *et al.* 2007). Accordingly, if this strategy is successfully implemented, one can expect that scholarly articles appearing in practitioner-oriented journals will differ significantly in their characteristics from

those published in academic journals. In contrast, if the parallel strategy prevails, only one type of scholarly article, targeted at peers, occurs where one would expect few article differences. The indicator of article differences does not apply to the collaboration strategy, since if scholars take this approach they engage in joint knowledge production with practitioners. As a consequence of this non-separation of author groups, articles written exclusively by scholars have little dissemination. Due to its discriminative power between the transfer and parallel strategy, the application of this indicator is nevertheless worthwhile. Several bibliometric measures of article differences, especially concerning the structure of references are available, some of which are applied in the case study that follows (for a listing with description of variables, see Appendix B). To summarize the stated indicators, table 1 contains their magnitudes depending on the various strategies of relating theory to practice. In order to examine the validity of this operationalization, it is subsequently applied to a management discourse. As mentioned above, the field under study is the German debate on public management.

CASE STUDY ON THE GERMAN PUBLIC MANAGEMENT DEBATE

In presenting the case study, I will proceed as follows, firstly briefly introducing the case setting by giving some background information on the institutional structure of public management in Germany. I then make some remarks on the data and methods used and successively present the results of the bibliometric analysis for each of the derived indicators. I then discuss these results in the framework of the strategies outlined above and point out some limitations of the study.

Case setting

Public management in Germany is a scattered field with multiple disciplinary identities. This multi- rather than interdisciplinary constitution also holds true for the broader field of public administration which the subfield of public management interacts with. German public administration has been referred to as a 'composite discipline' (Benz 2005). As such, it is an amalgam of legalistic, political, sociological, historical, economic and managerial approaches which relate to each other in an additive rather than an integrative way. However, the contribution made to academic discourse by these various perspectives, rooted in different academic traditions and theoretical heritages, varies considerably. There is a predominance of legalistic accounts due to the rule of law which has a strong tradition in continental Europe, especially in the German authoritarian *Rechtsstaat* with its administrative culture emphasizing bureaucracy (Jann 2003; Kickert 2005). Due to this predominance of jurisprudence, public management as a field of scientific inquiry has had, in Germany, relatively limited development potentialities. In the course of the last two decades, however, economic and managerial approaches to public administration have gained importance through administrative reforms under the conceptual lead of

TABLE 1 *Strategy indicators*

	Collaboration intensity	Journal exclusivity	Article differences
Parallel strategy	low	high	low
Transfer strategy	low	low	high
Collaboration strategy	high	low	–

new public management (NPM) (Wollmann 2000; Reichard 2003). Belatedly joining the international NPM movement (but subsequently interfering with it only to a limited extent), proponents of public management have intensively discussed approaches such as de-bureaucratization, lean management, business process re-engineering, output control, management by objectives, budgeting, benchmarking, public private partnerships, privatization, and so on. Since the corresponding reforms have primarily involved a practice-driven movement emanating from the local level of the administrative system, the public management debate in Germany is by no means dominated by academicians but offers an arena for a wide range of debaters, including administrative practitioners, representatives of interest groups, staff of think tanks, consultants, politicians, and so on.

The dissected structure of public administration in general and public management in particular is also reflected in its institutional embedding in the German academic sector (Bogumil 2005). At universities, public management has a relatively low degree of institutionalization. Among public institutions, only the University of Constance and the University of Potsdam award masters degrees in public management and policy. A singularity is the German University of Administrative Sciences in Speyer with a special post-graduate education programme in public administration. Recently, the diversity in this field has increased due to the establishment of two private universities, Hertie School of Governance in Berlin and Zeppelin University in Friedrichshafen, which offer similar degree programmes. These promising developments, however, are in part counterbalanced by the disestablishment of solitary chairs of public management in business departments at other universities. Nevertheless, public management is still much more strongly institutionalized at universities of applied sciences and management academies where it has considerable presence as represented by the curricula.

In accordance with the fragmented disciplinary structure of public management in Germany, the publication system in this field is likewise heterogeneous. With respect to journals, the German community lacks an outlet that is strictly focused on public management. Instead, periodicals specialized in the public sector commonly cover a wide range of topics, including general public administration, administrative law, IT, civil service, and so on. The coverage of management topics in these periodicals varies; articles on public management are more likely to be published in application-oriented media rather than in academic journals. But nothing like a 'home journal' of public management exists in Germany. For the present study, this required careful data sampling. The selection procedure as well as the methods of data analysis are described in the section that follows.

Data and methods

To address the issue, bibliographic information on articles in the field of public management has been stored in a database – unique in that it has been constructed as a kind of miniature citation index for the public management debate in Germany. The necessity of primary data collection has emerged for two reasons. Firstly, as already mentioned, available literature databases usually contain academic publications taken from high quality, peer-reviewed journals only. However, the research background of this paper in the debate on the theory-practice divide in public management and policy gives rise to an interest both in academic as well as in non-academic, more application-oriented media. To foster a better understanding of the interface between theory and practice, both sides must be taken into account.

Secondly, accessible citation indexes usually have an Anglo-American bias so that national peculiarities such as the German public management debate are difficult to

retrace based on the information these databases provide. Although there are some signs of convergence, the European administrative sciences are still rooted in strong national traditions (Kickert 2005). Consequently, primary data collection was inevitable.

For documentation purposes, journals as well as individual articles had to be selected. With regard to analysed journals, three selection criteria were applied in the convenience sampling. Firstly, only journals which appear or appeared in Germany were taken into account; secondly, these periodicals had to meet the criterion, by their core mission, of being specialized in the public sector; and thirdly, they had to possess no further sectoral, regional or topical specialization. This last criterion especially demanded some consideration by the present author since, in German public administration, there is a clear bias towards journals primarily focused on law. The final journal sample (see Appendix A) contains periodicals that are not exclusively restricted to public law, but also cover articles on public management – although in some cases contributions of this kind make up a tiny minority. The selected journals were, through an analysis of their mission statements, editorial boards, author structures and topical coverage, in addition subdivided into an academic and a practitioner-oriented group. The period of sampled documentation ranges from 1989 to 2005 and thus covers the most recent wave of public management reforms in the German administrative system, especially on the level of local governments (Wollmann 2000; Reichard 2003; Benz 2005; Ridder *et al.* 2005). In a systematic sampling, every second volume of each journal was documented.

A selection of articles was then conducted in order to exclude contributions from the analysis which did not directly relate to public management topics. In the first instance, a controlled vocabulary was extracted from selected German textbooks on public management (Damkowski and Precht 1995; Naschold and Bogumil 2000; Schedler and Proeller 2006; Thom and Ritz 2008). From the glossaries and subject indexes of these textbooks, a list of keywords was compiled, which served as descriptors of public management. In a content analysis of the articles covered in the journals analysed (not including news, editorials, readers' letters, commentaries, book reviews, interviews, conference reports, and so on), contributions featuring one or more index terms in their titles, abstracts, keywords and/or headings were indicated and independently reviewed by two people (the researcher and a graduate student) for their topicality in relation to public management. Where the two reviewers disagreed, the articles were discussed and finally either included or excluded on the basis of the fact that if doubts on an article's topical significance remained, it was excluded. This selection procedure resulted in a database of 892 articles on public management, authored by 838 persons. Each article was documented with its title, pages, author(s) (with name(s) and institutional affiliation(s)) and references (with name of first author, year of publication, document type, language and title, editor (if an edited book)).

The data analysis proceeds along the indicators mentioned above. For collaboration intensity and journal exclusivity, the entire database as outlined above has been taken into account. Here, the method primarily rests on descriptive statistics, supplemented by comparative data available from the literature. For the indicator of article differences, only those articles which have been authored by members of academic organizations have been taken into account. This selection is due to the emerging research question of whether or not articles written by scholars in the field of public management differ depending on the type of journal in which they appear and, if so, in what way they differ. The resulting selection of the sample, excluding contributions (co-) written by practitioners, consists of 230 articles, containing 10,417 references. On this database, a more advanced bibliometric

analysis is applied, namely a logistic regression analysis based on a set of bibliometric predictor variables as measures of article characteristics (see Appendix B). The dependent variable is the 'group membership' of each article, depending on the profile of the journal in which they appeared (academic versus practitioner-oriented). In the regression analysis it is controlled for the year of publication because a discourse may change in structure over time, including the possibility of shifting its focal point from the non-academic to the academic sector (and vice versa). The documented years, therefore, coded as dummy variables, are included in the regression model.

Results

Collaboration intensity

In the first instance, collaboration among participants in the German public management debate is displayed in the number of multi-authored articles. The percentage of articles written by more than one author accounts for 21.6 per cent. Most of the co-authored articles have two authors (175) whereas a much lower number is authored by three persons (16). At any one time, only one article has been written by four and five authors (see Appendix C, section 1.1 in figure C1). This first impression of a low collaboration rate is confirmed when another indicator is used. During the whole time series between 1989 and 2005, the average number of authors per article was 1.24. This indicator gets more explanatory power if it is used for comparisons between different scientific fields. In one of the first inquiries to include management and organizational studies, Wuchty *et al.* (2007) present, *inter alia*, the same key figure of collaboration intensity. Table 2 displays the results of their study for comparative purposes. As can be seen, the field under investigation has one of the lowest average numbers of authors per paper among the disciplines taken into account.

The results show a strong tendency towards a greater collaboration propensity, indicating a shift towards a more collaborative fashion of knowledge production. As shown

TABLE 2 *Comparison of collaboration intensity in different fields*

Field ^a	Authors per paper	Fraction of team-authored papers (%)	Mean team size
Psychology	2.57	72	3.18
Education	1.97	51	2.90
Anthropology	1.93	40	3.33
General management	1.91	61	2.49
Economics	1.71	52	2.37
Public administration	1.51	39	2.31
Sociology	1.50	34	2.47
Law	1.35	20	2.75
Public management (present study)	1.24	22	2.11
Political science	1.23	17	2.35

Note: ^aAll fields 1996–2000 except of public management 1989–2005.

Sources: Author's own calculations and data; based on work by S. Wuchty, B.F. Jones and B. Uzzi. 2007. 'The Increasing Dominance of Teams in Production of Knowledge', *Science*, 316, 5827, 1036–9.

Note: Wuchty *et al.* (2007) report the indicator 'authors per paper' as 'team size'. Both measures display the average number of authors per paper, but the first includes single-authored papers, whereas the latter excludes them because a team is defined as having more than one listed author. For the present table, this anomaly is corrected. For other comparative data, see Acedo *et al.* (2006a, p. 963) and Glanzel (2002, p. 465).

in Appendix C (section 1.2 of figure C1), a significant increase in the average number of authors can be observed since the beginning of the 1990s. In principle, this trend of increasing formal collaboration can be composed of two effects (Laband and Tollison 2000; Acedo *et al.* 2006a.). Firstly, the incidence of co-authorship may increase, that is, the proportion of articles with more than one author. This holds true for the present study (Appendix C, section 1.3 of figure C1). Secondly, the extent of co-authorship (that is, the average number of members of author collectives) may grow. As indicated by Appendix C (section 1.4 of figure C1), this development cannot be observed in the German public management debate. The average size of author collectives does not significantly change over time. Thus, the increase in the average number of authors per paper is due to an increased frequency of co-authorship rather than to an increase in the average size of author collectives. This finding can also be derived from the similarity of the curves in sections 1.2 and 1.3 of figure C1 (Appendix C).

In spite of the rising importance of co-authorships worldwide, the collaboration intensity in the German public management debate remains on a relatively low level. Let us look more closely at the few occurring collaborations. I start with a simple count of different kinds of collaboration. If the debaters collaborate, with whom do they do so? To deal with this question, the institutional background in terms of organizational membership of each author has been extracted from biographical notes in the journals. In table 3, the various combinations are displayed, based on five categories. Authors who do not belong to any of these groups, as well as those for whom no biographical information was available, have not been included.

The main diagonal of the data matrix covers the intra-sectoral collaborations, whereas the other entries reflect inter-sectoral co-authorships. All in all, there is a predominance of intra-sectoral collaborations. That is, the authors seem to have a preference for co-authors who come from their own sector. This holds especially true for members of academic organizations (universities and universities of applied sciences). The vast majority of papers which belong to this group have even been co-authored by members of the same institution. The database contains only two cross-organizational collaborations within the academic sector that result in joint publications. Nevertheless, intra-sectoral collaborations are not preferred by all author groups; two exceptions illustrate this. Executives in consultancies and members of think tanks cooperate more often with authors from a different sector than from the same sector. In particular, the relatively high number of author collectives consisting of consultants and management practitioners is striking. This fact may be due to the marketing strategies of consultants who try to popularize the results of consulting projects in the public sector. The authorship and publishing of articles in practitioner journals together with project partners could be a

TABLE 3 *Counts of collaborations in author collectives*

	(1)	(2)	(3)	(4)	(5)
(1) University	40				
(2) University of applied sciences	1	6			
(3) Consultancy	4	0	18		
(4) Think tank	2	0	3	3	
(5) Management practice	7	1	23	4	52

TABLE 4 *Co-authorships*

	Academicians	Mixed	Practitioners
Count	47	14	103
% of co-authored articles	28.7	8.5	62.4
% of all articles	5.7	1.7	12.4

relatively effective way of gaining publicity. In the German discourse, there are a great number of success stories of this kind of quasi-advertising.

Nonetheless, the majority of collaborations are limited to intra-sectoral co-authorships. Table 4 again highlights this finding. For these figures, universities and universities of applied sciences are aggregated to an academic sector, whereas the non-academic sector is composed of the remaining categories. As can be seen, only 14 mixed author collectives appear, consisting of members from both academic and non-academic organizations. That is, in the public management debate, only 8.5 per cent of all co-authored articles and 1.7 per cent of all articles for which the relevant biographical information was available have been co-produced by academic and non-academic participants. In spite of the self-image of administrative science as applied science, this figure does not exceed by much the corresponding measures in highly academic management research. In the time period from 1994–99, 4 per cent of the articles in the *Academy of Management Journal* and less than 1 per cent of the articles in *Administrative Science Quarterly* listed academicians and practitioners as co-authors (Amabile *et al.* 2001, p. 419).

Journal exclusivity

Table 5 shows the indicator of journal exclusivity for the German public management debate. As can be seen, the institutional backgrounds of authors both in academic and non-academic journals are far from homogenous. On the contrary, to a remarkable extent, academic as well as non-academic authors publish in both journal types. In academic journals, more than every third article is written by non-academic authors. Conversely, every fourth article in non-academic journals has authors who are members of academic organizations. Thus, both journal types are characterized by non-exclusivity for different author groups. As a result, scholars who engage in the German public management debate span the boundaries between academic and non-academic sectors by publishing not only in academic journals, but also in non-academic media. Reflecting these results, a further research question arises. If academic authors engage as border crossers, do their contributions differ notably depending on the journal category they fall into and, if so, to which extent and in what way? That is, do scholars choose different modes of knowledge production and communication when they publish in journals with different target groups? This question will be addressed in the next section.

TABLE 5 *Single authorships*

		Author	
		Academician	Practitioner
Journal	Academic	80	47
	Practitioner-oriented	224	689

Article differences

To measure differences between the scholarly papers which appear in academic journals and their equivalents in practitioner-oriented media, logistic regression analysis is applied. For this purpose, the analysis draws on a selection of those articles on new public management which have been authored by scholars, that is, by members of academic organizations. Appendix D provides descriptive statistics of the bibliometric variables along with a correlation matrix for the sample. As can be seen from the Appendix, the highest correlation (Pearsons r) between any two independent variables is 0.354, between 'article – length' and 'references – intensity'. Similar levels of correlation can be observed between 'article – length' and 'references – number/page' as well as between 'references – impact' and 'references – law'. Based on these indicators, it can be presumed that problems of multicollinearity are not evident. This assumption is confirmed when the condition indexes and variance inflation factors are analysed. The largest condition index is 5.793, and the largest inflation index is 1.810. Since these values do not affect the prevailing thresholds, multicollinearity should not be taken into account, allowing binary logistic regression analysis to be performed.

Before estimating the regression parameters, I draw on some group statistics. As table 6 indicates, significant differences in the means of all bibliometric variables appear when comparing scholarly articles in academic and non-academic journals. The Mann-Whitney-U-test is significant for five variables at the level of $p < 0.001$ and for the remaining three variables at the level of $p < 0.01$. Scholars who publish in academic journals write significantly longer articles, make more references per page, cite each reference more often, use older sources, refer to journals with higher impact and have a higher proportion of foreign-language and law references than their colleagues who publish in non-academic journals. However, their collaboration propensity is lower. On average, a scholarly article which appears in an academic journal is authored by 1.1 persons, whereas a paper in a non-academic one is written by 1.3 authors. Compared to other disciplines (see table 2, above), both values are low.

Appendix E presents the full regression model including the control variables. The coefficients for two variables are highly significant at the level of $p < 0.001$. These predictors are 'article – length' and 'references – law'. One further variable ('references – impact') contributes significantly ($p < 0.05$) to the discrimination between academic and non-academic

TABLE 6 *Group statistics and Mann-Whitney-U*

Bibliometric variable	Journal type				Mann-Whitney-U	p-value
	Academic		Practitioner-oriented			
	Mean	SD	Mean	SD		
Article – length	9.593	3.071	5.119	2.135	1194.500***	0.000
Authors – number	1.100	0.347	1.280	0.491	4622.000**	0.003
References – number/page	7.187	3.214	3.417	2.852	1203.500***	0.000
References – intensity	1.663	0.573	1.257	0.390	1862.500***	0.000
References – age	7.066	4.722	5.408	4.007	2861.000**	0.007
References – impact	0.043	0.021	0.026	0.023	1791.000***	0.000
References – language	0.224	0.230	0.173	0.272	2745.000**	0.001
References – law	0.203	0.167	0.056	0.120	1463.500***	0.000

Note: * $p < .05$; ** $p < .01$; *** $p < .001$

journal articles. Another regression coefficient ('references – age') is partially significant ($p < 0.1$). None of the control variables were found to have significant influence on the group membership of the articles.

The appropriateness of the model is revealed when looking at the overall goodness-of-fit-statistics. The χ^2 statistic as well as the Hosmer-Lemeshow-test (not reported) gives no reason to doubt its adequacy. The pseudo- R^2 statistics point in the same direction. Cox-Snell and Nagelkerke pseudo- R^2 measures signify that a substantial portion of variance of the dependent variable can be explained with the predictors in a multivariate model. Alternatively, the adequacy of the regression model can be evaluated with regard to its predictive success (table 7). By using the bibliometric variables as predictors of group membership, 89.4 per cent of the scholarly articles can be correctly related to either the academic or the practitioner-oriented journal type. The results of a discriminant analysis (not reported) differ only marginally from those of the logistic regression analysis. It should be noted, however, that these classification results systematically overestimate the accuracy of the models because they are calculated on the same database on which the parameters have been estimated.

DISCUSSION

What do the findings tell us about the way theory and practice relate to one another in the public management debate in Germany? Given the stated magnitudes of the indicators, it can (depending on the respective strategy summarized in table 1, above), be concluded that the collaboration strategy has not been implemented hitherto in the field under study. This is shown by the low overall collaboration intensity in the field. Although there has been a strong tendency towards a more collaborative fashion of knowledge production over the last few years, the collaboration propensity remains at a low level. This especially holds true if the measures are compared with those of other scientific disciplines. Furthermore, not only the scale, but also the nature of co-authorships offers important insights. As is demonstrated, the vast majority of author networks consist of members of the same (academic or non-academic) sector. Conversely, this study shows a negligible number of papers authored in cross-sectoral collaboration.

Likewise, in the German public management debate, the parallel strategy is not the dominant approach of relating theory to practice. This can be deduced from the indicator of journal exclusivity which differentiates between the parallel strategy and the other strategies. As stated above, a high exclusivity of journals in terms of author homogeneity is a distinguishing feature of the parallel strategy. However, in the case of German public management, journal exclusivity is low, since scholars frequent non-academic,

TABLE 7 *Classification results (%)*

		Predicted	
		Academic	Practitioner-oriented
Original	Academic	91.2 (88.2)	8.8 (11.8)
	Practitioner-oriented	12.0 (9.8)	88.0 (90.2)
		89.4% (89.4%) of the original grouped cases were correctly classified.	

Note: numbers in parentheses represent the classification results of discriminant analysis.

application-oriented journals to a remarkable extent. That means, the publication channels of scholars and practitioners in the field of public management are not separated as clearly as in general management. Rather, in journals targeted at an audience of practitioners, articles authored by scholars and practitioners appear side-by-side. This finding becomes plausible when considering that in the investigated field, there are a great many knowledge pieces which are neither solely academic nor solely practical in orientation. In fact, many articles are 'ambidextrous' in that they are a mixture of descriptive, explanatory and prescriptive statements. Since this knowledge is not solely targeted at the professional group of academicians, scholarly journals are not the only channel for its transmission.

Consequently, the results give reason to assume that, in the public management debate in Germany, the theory-practice problem is mainly dealt with by choosing the transfer strategy. This finding is confirmed by the third indicator, that is, article differences. High differences can only be expected when the transfer strategy prevails (see table 1, above). Indeed, scholarly articles in application-oriented journals differ significantly from their counterparts in academic journals as the group statistics and the regression analysis conducted above show. One conclusion which can be derived from this finding is that scholars have the ability to adjust their 'writing style' to the journal in which they publish. They communicate with knowledge users in a way which would be atypical of academic journals. Of course, in doing so, the authors may only satisfy the standards of the journals, but this does not affect the interpretation here. Insofar as these standards reflect the expectations of the target groups of the journals, the results demonstrate that scholars are both able and willing to publish under conditions which are mainly shaped by expectations of practitioners.

The finding of a preferential treatment of the transfer strategy becomes highly plausible – and thus points to the validity of the developed set of indicators – when viewed in light of the institutional background of public administration in Germany. Neither the parallel nor the collaboration strategy currently finds comparable conditions of implementation. The parallel strategy – which would establish the most distant relationship between theory and practice – would fundamentally violate the self-perception of German public administration as an 'applied science'. As outlined above, public management in Germany is more strongly institutionalized at universities of applied sciences than at universities. By their very mission, universities of applied sciences and similar institutions pursue an application-oriented, problem-driven approach and thus have little fear of contact with administrative practice. Throughout the history of administration and administrative science in Germany, the interest of public agencies in support by training schools has triggered the 'academization' of public administration (Mayntz 1997). The interference with administrative practice has also become visible in the strong involvement of German scholars in the public management reforms which, since World War II, have swept the public administration sector (although less so in the course of the more recent NPM movement) (Wollmann 2000). Altogether, the parallel strategy seems to fit the German situation only to a very limited extent.

While the neglect of the parallel strategy is highly intuitive when considering the situation in Germany, it is, at first glance, less clear why among the strategies which foster a tighter coupling of theory and practice, there is a strong preference for the transfer strategy over the collaboration strategy. Taking a second look, there are several factors which constrain cross-professional collaborations between scholars and practitioners. From the perspective of scholars, the conduct of empirical research in public agencies

can be assumed to be the main motive for collaborating with practitioners. However, in German public administration, with its strong legalistic bias, the empirical branch of administrative research is not well developed. In particular, most approaches of public management that follow the guiding principles of NPM have been normative in concept, adopted as panacea from a business context (Bogumil 2005). Hitherto, there have been surprisingly few empirical evaluations of these management tools (for a rare exception, see Jaedicke *et al.* 2000). Only relatively recently has there been a large-scale empirical evaluation of the most prominent concept, the New Steering Model, which is widely acknowledged to be the German variant of NPM (Bogumil *et al.* 2007). As indicated by the sparse evaluations of managerial reforms in Germany, the supply of empirical administrative research which results in boundary-spanning collaborations is limited.

From the perspective of practitioners, there are reasons why the demand for collaborations with scholars is also limited. The affinity of practitioners for collaboration with organizational researchers can be assumed to depend largely on their own academic education. If they had little contact with this kind of research in the course of their studies, they will continue to restrict themselves to methods of empirical inquiry. Since in German administration there is still a virtual monopoly of people trained in law (Bogumil 2005), whose academic education encompasses few social studies of public agencies, the affinity for collaborations with scholars from social studies is not widespread. For the same reason, the administrative culture is one of risk-avoidance, which negatively rewards rule deviation. The conducting of empirical research by outsiders could be perceived, therefore, as a dangerous source of revealing internal failures. Altogether, then, the German administration's doors are not found to be wide open for empirical research.

In conclusion, when taking the specific situation in Germany into account, it is reasonable that the transfer approach of addressing the theory-practice gap is the dominant strategy to be found in the German public management debate. Thus, in the case at hand, the bibliometric indicators have shown some predictive power in terms of showing which strategy theory and practice relate to each other in the field under investigation. In order to further strengthen the empirical underpinnings of the current debate on the theory-practice divide, subsequent research could take two directions. Firstly, it is unclear how well the findings of the present study generalize to other subfields of European administrative sciences. In Germany, the transfer strategy to address the theory-practice gap prevails in the public management debate. The question of whether or not the other strategies prevail somewhere else, however, remains unanswered. Future research could address this issue by applying the methodology developed in this article to other subfields of public administration, in general, and public management in particular. Secondly, since the bibliometric method has some inherent limitations, subsequent research endeavours could aim to supplement the bibliometric method with other methods. The quantitative approach of bibliometrics lacks the analytical capabilities that would be necessary if knowledge production were to be comprehended as an act of sense-making. Therefore, qualitative methods offer the potential of illuminating aspects which remain unexplored when approached only by means of bibliometrics. In order to equalize the inherent shortcomings and pitfalls possessed by each scientific method, to deal with a multifaceted issue such as the theory-practice gap requires methodological diversity.

CONCLUDING REMARKS

The issue of how theory and practice relate to each other can be assumed to be essential to disciplines with the self-image of applied sciences such as public administration and therefore deserves close attention by scholars in this field. Public administration operates at the intersection of the sphere of academia and the sphere of management and policy, and scholars both build theory and address practical problems in their work (Dodge *et al.* 2005). In this article, I have argued that the discussion on the appropriateness of various strategies of relating theory to practice would benefit from being enriched with more empirical evidence on their actual implementation in management debates. The study at hand provides the first insights in this respect, but from the results (in that the investigation was strictly empirical in focus), no information can be derived regarding which strategy of facing the theory-practice divide is the most promising. Likewise, no conclusions can be drawn regarding whether scholars in the field of public management succeed in solving the transfer problem. Rather, the penetration rates only of the various strategies were examined. In the German public management debate, the transfer strategy has priority. In order to allow for comparisons and to foster mutual learning, the debate would benefit from more empirical evidence from other subfields of public administration in Europe.

It is debatable whether the preferential treatment of the transfer strategy will be successful in the long run. For those who support the collaborative approach of bridging theory and practice, the low collaboration rates documented in this study must alarm. These proponents can be found not only in the debate on the theory-practice gap (D'Aunno 2005; Dutton 2005; Pettigrew 2005). In another debate of high topicality, 'collaborative public management', the collaborative advantages of cross-sectoral networks in public management and governance are also stressed (Agranoff and McGuire 2003; Skelcher *et al.* 2005; Brandsen and Pestoff 2006; O'Leary *et al.* 2006; Eglene *et al.* 2007; O'Leary and Bingham 2007; Weber *et al.* 2007). The two debates have not drawn on each other in this respect so far, in spite of some starting points for cross-fertilization. On the one hand, the growing body of knowledge on collaborative governance can provide deeper insights into various aspects of cross-sectoral collaboration, such as organizational arrangements, appropriate coordination mechanisms, effective leadership, learning processes, collaboration costs and so on. The theory-practice debate could partly apply the rapidly increasing knowledge in this field to collaborations of scholars and practitioners as an alternative (and for many a more promising) strategy of bridging theory and practice. On the other hand, it is debatable why most claims for collaborative public management have excluded the academic sector so far. The collaborative public management movement could be inspired by the idea of including scholars in collaborative networks to enable mutual learning experiences and, ultimately, to improve decision quality in public policy. The theory-practice debate provides some concepts in this regard and therefore is a debate that has important implications far beyond its own area of discussion.

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APPENDIX A

TABLE A1 Selected journals

Journal title	Category*	Documented volumes									
		1989	1991	1993	1995	1997	1999	2001	2003	2005	
Die innovative Verwaltung	P	-	-	-	1	3	-	-	-	-	
Die Neue Verwaltung	P	-	-	-	-	6	8	10	-	-	
Die Verwaltung	A	22	24	26	28	30	32	34	36	38	
Die Öffentliche Verwaltung	A	42	44	46	48	50	52	54	56	58	
Verwaltung & Management	P	-	-	-	1	3	5	7	9	11	
Verwaltungsarchiv	A	80	82	84	86	88	90	92	94	96	
Verwaltungsorganisation	P	-	25	27	29	-	-	-	-	-	
Verwaltungsgrundschau	P	35	37	39	41	43	45	47	49	51	
VOP (1989-2001); Innovative Verwaltung (2003-2005)	P	11	13	15	17	19	21	23	25	27	

Notz. * A = academic, P = practitioner-oriented.

APPENDIX B

TABLE B1 *Bibliometric variables*

Variable name	Description
<i>Article – length</i>	This variable counts the number of pages of the article, adjusted to A4 paper size. It is an approximate measure because the formatting of the journals may differ considerably.
<i>Authors – number</i>	With this measure, the number of authors of the article is documented. Hence, it displays the collaboration propensity of scholars who engage in management debates.
<i>References – number/page</i>	This variable counts how many references are made on each page of the article. Once again, the standard paper-size forms the basis of the measurement.
<i>References – intensity</i>	This variable displays how often the references are on average cited within the text. Thus, a sort of utilization rate of the references is ascertained.
<i>References – age</i>	With this indicator, the average time span between the publishing of the citing and each cited text is documented. The measuring unit are years. The variable indicates the topicality of the reference list of the article.
<i>References – impact</i>	This key figure is the average impact factor of cited journals. However, the prevalent impact factors as offered by the Journal Citation Reports of Thomson Corp. are not available for the analysis to be performed here. This is due to the fact that only a minority of journals which are cited in national specialties like the German public management debate are contained in the common international citation indices. Thus, an alternative measure has been introduced. In a comparable investigation, Gmür (2002) defines the impact of a journal J as follows: $IF_J = \sqrt{\frac{\# \text{ of cited articles of } J}{\# \text{ of all cited articles}} \times \frac{\# \text{ of articles citing } J}{\# \text{ of all articles}}}$ This impact factor can be interpreted as the penetration rate of a journal in a certain discourse. It lies in the range of 0 and 1. An imaginary monopolistic journal which is cited in all articles and beside which no other journal is cited would reach the impact factor of 1.
<i>References – language</i>	This variable is the proportion of foreign-language (non-German) references in the article. It shows the international orientation of its author(s).
<i>References – law</i>	This figure is the proportion of juristic references such as laws, regulations, adjudications, official gazettes and so on. What is expressed by this variable is an aspect of the topical profile of the article with respect to the strong traditions of jurisprudence in German administrative science.

APPENDIX C

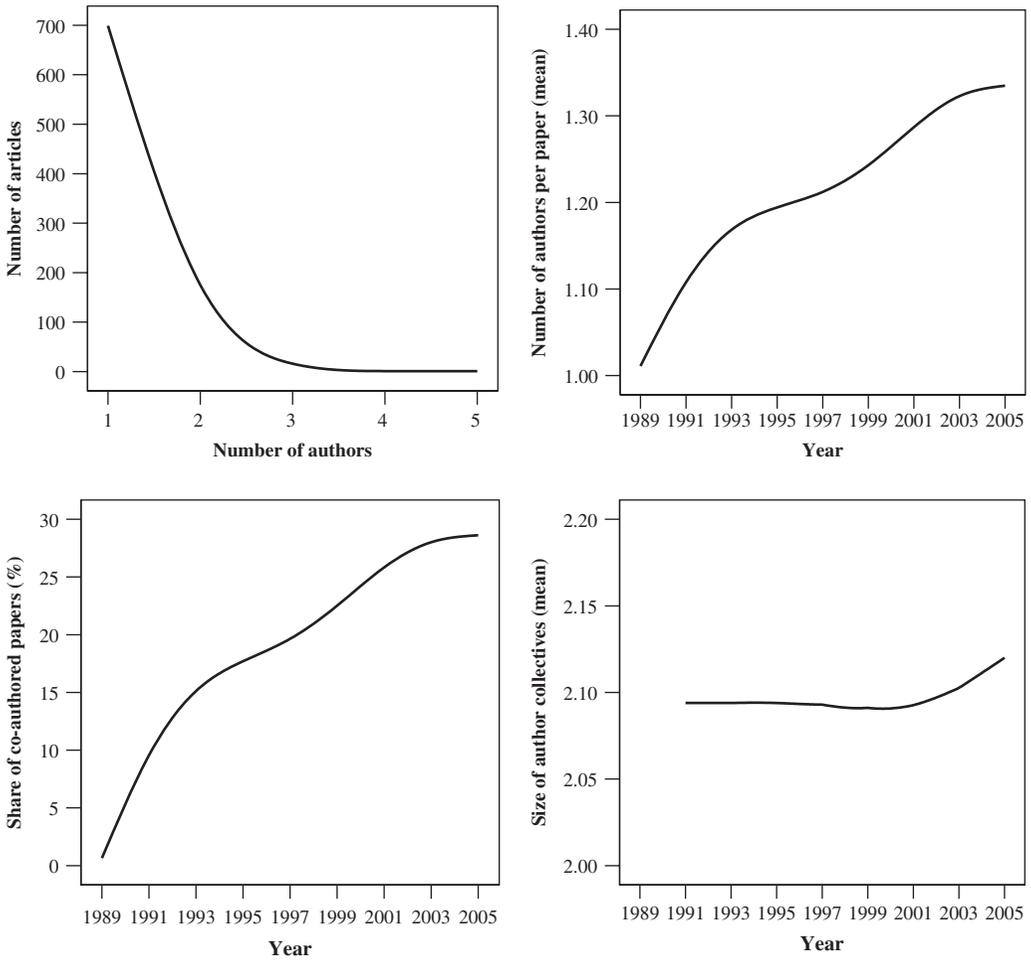


FIGURE C1 *Indicators of collaboration intensity.*
 Note: Curves smoothed.

APPENDIX D

TABLE D1 Summary statistics and correlation matrix

Variable	Mean	SD	Min	Max	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) Article – length	6.480	3.204	1	16.5	1.000							
(2) Authors – number	1.230	0.459	1	3	-0.043	1.000						
(3) References – number/page	4.825	3.500	0.167	19.667	0.347***	-0.187**	1.000					
(4) References – intensity	1.410	0.506	1	3.609	0.354***	-0.127	0.282***	1.000				
(5) References – age	6.038	4.355	0	30.217	0.131	-0.128	0.148*	0.150*	1.000			
(6) References – impact	0.033	0.023	0	0.099	0.181*	-0.129	0.243**	0.132	0.004	1.000		
(7) References – language	0.192	0.258	0	1	0.136	0.096	0.135	0.034	0.070	-0.292***	1.000	
(8) References – law	0.111	0.156	0	0.857	0.139	-0.129	0.281***	0.292***	0.094	0.347***	-0.144	1.000

Note. * p < .05; ** p < .01; *** p < .001

APPENDIX E

TABLE E1 *Logistic regression (dependent variable: journal type)*

	B	SE	Wald	p-value	odds ratio
<i>Bibliometric variables</i>					
Article – length	2.193	0.504	18.935***	0.000	8.959
Authors – number	–0.519	0.326	2.530	0.112	0.595
References – number/page	0.325	0.341	0.910	0.340	1.384
References – intensity	0.123	0.538	0.052	0.819	1.131
References – age	0.489	0.271	3.252	0.071	1.631
References – impact	0.881	0.416	4.490*	0.034	2.414
References – language	0.407	0.297	1.876	0.171	1.503
References – law	2.207	0.573	14.820***	0.000	9.091
Constant	–3.000	1.586	3.576	0.059	0.050
<i>Year controls</i>					
1991	–0.998	3.209	0.097	0.756	0.369
1993	2.466	1.972	1.564	0.211	11.780
1995	0.930	1.640	0.321	0.571	2.534
1997	–1.563	1.885	0.687	0.407	0.210
1999	–0.260	1.710	0.023	0.879	0.771
2001	1.371	1.657	0.685	0.408	3.939
2003	0.411	1.820	0.051	0.821	1.508
2005	–0.328	1.672	0.039	0.844	0.720
<i>Self-reported measures</i>					
–2 log likelihood		77.998			
χ^2 , df, p-value		140.196, 16, 0.000			
Cox & Snell R^2		0.584			
Nagelkerke R^2		0.784			

Note. *p < .05; **p < .01; ***p < .001

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