

Institutional factors influencing knowledge production for practice: Evidence from nonprofit studies

Ji Ma¹, Joycelyn Ovalle¹, Yan Wang²,

1 The LBJ School of Public Affairs and RGK Center, The University of Texas at Austin, Austin, TX, USA

2 Department of Sociology, Zhejiang University, Hangzhou, Zhejiang, China

* maji@austin.utexas.edu

Abstract

This study theorizes and tests an institutional-logics framework to explain why some universities produce more practical knowledge than others using nonprofit studies as an example. Empirically, knowledge production for practice can be increased by (1) graduate degree programs with an emphasis on nonprofit management, (2) research centers on nonprofit studies, and (3) location in disadvantaged communities; however, (4) status as an R1 or R2 research university substantially decreases the production of practical knowledge. Furthermore, (5) research centers can mediate the influence of community needs on knowledge production, so that universities with nonprofit research centers are more responsive to solving community issues. Theoretically, knowledge production follows the institutional logics of both closed and open systems, and institutions such as research centers that can repackaging the culture of open systems to make it acceptable to closed systems are essential mediators.

Introduction

Practical scholarship offers critical knowledge for understanding and solving “real-world” problems. However, such efforts have been a difficult endeavor in many research fields of social sciences, such as sociology, political science, management, and implementation science. The gap between theoretical and practical knowledge can be interpreted through three lenses: knowledge transfer problems, the nature-of-knowledge problem, and knowledge production problems [1]. Applying research findings to practice requires additional efforts of transformation, which often do not align with the interests of scholars and are not as highly valued within academia compared to theoretical works. Theoretical knowledge and practical knowledge also differ epistemologically because they are different ways of knowing. The former is believed to unveil the nature of things, context-free, and to be committed to building generalizable laws and principles. While the latter is often context-specific, made for solving particular problems, limited in generalizability, and treated as derivative from theory and therefore a secondary way of knowing.

The gap between theory and practice, itself theoretically a knowledge production problem, becomes an institutional problem in practice. The academic tenure process, funding criteria, and editorial policies largely favor theory-building but discount practical knowledge. This viewpoint has attracted growing attention because it targets the root causes and provides potential routes to change. Take implementation science

for example. This research field was initially created to systematize the implementation of evidence-based programs, highlights the importance of institutional contexts that can impede the integration of evidence or practice-based programs or initiatives in organizations [2,3]. However, merely having these practices available is not enough for widespread adoption and successful implementation. It is crucial to consider the institutional contexts in which these practices are intended to be implemented, taking into account factors such as leadership support, organizational culture, resource availability, workforce capacity, and external influences [4].

This study adopts the knowledge production perspective and uses nonprofit studies, a social science research field tightly connected to practice, as an example to examine the institutional factors that influence the production of practical knowledge. We studied these factors at three levels of analysis: *program*, *organization*, and *community*. We also theorize a framework of institutional logics to interpret how these factors influence knowledge production for practice. We empirically test this framework with data from various sources, state-of-the-art (SOTA) natural language processing (NLP) algorithms, and robust statistical analysis. In a nutshell, in order to produce more practice-oriented scholarship, the knowledge production process needs to be facilitated by an open-system logic that emphasizes the engagement of various stakeholders, such as students and local communities. The process can also be mediated through knowledge transfer channels, such as research centers on nonprofits and philanthropy, that can shift the logics between closed and open systems and facilitate the sharing of knowledge between scholars and practitioners.

Narrowing the divide: In search of a coherent framework

Nonprofit studies is an interdisciplinary social science research field that focuses on the practices of nonprofit organizations and originated in the 1920s [5]. The practical needs of the nonprofit sector and policy making are key to the existence of this field and related educational programs [6,7], but the gap between scholars and practitioners has a history as old as the field itself. Scholars found that although academic publications on nonprofit studies in the field's early years responded to practitioners' common concerns, the coverage of these articles was much narrower than practitioners' needs [8,9]. A review of a leading journal of nonprofit studies, for example, revealed that only 23 percent of the journal's publications between 2000 and 2010 distilled practical implications for nonprofits [10]. Such a pattern underscores the point that academia's concerns are predominantly theoretical and often deviate from those of practitioners [8]. Unfortunately, that situation has persisted for decades in this research field [11].

To narrow the gap, communication and collaboration between scholars and practitioners—for example, engaging practitioners at different stages of research, such as defining research questions, sharing data, and peer review [8, p. 306]—has been a key focus and the solution most referred to. The participation of practitioners in research can also influence academic research and teaching in broader ways, such as identifying new areas of research and changing teaching practices [11, p. 99]. [12] synthesized four important considerations for a successful collaboration: (1) relational, emphasizing building personal ties through different venues; (2) philosophical, recognizing the difference between different professions' norms; (3) organizational, underlining the organizational culture and needs behind collaboration; and (4) political and ethical, such as disciplinary politics and directing research focus toward academic benefits.

As the four considerations for a successful collaboration suggest, the gap between theoretical and practical knowledge is intricate. In the research field of nonprofits and philanthropy, scholars also explored other possibilities. For example, [13] suggested that the theory-practice gap can be narrowed by adopting an “abduction” process. This epistemological approach is different from conventional deduction and induction

approaches in its emphasis on “[c]reating a testable [and creative] hypothesis that best explains the surprising phenomenon” [13, p. 209]. The rapid growth of degree programs in higher education can also bridge the theory-practice divide [7, 14–16]. Nonprofit centers, by facilitating collaborations and supporting both scholars and practitioners, hold especially important roles in the knowledge transfer and knowledge production process [17].

The reasons for the theory-practice divide are multifaceted, and the scholarly bridging efforts as well as the perspectives informing them are scattered. We are in dire need of a coherent framework to interpret the mechanisms through which different factors can influence knowledge production for practice.

Producing practical knowledge: Influential factors at three levels

Existing studies on narrowing the theory-practice divide and related topics suggest that the analysis of influential factors works at three levels: the *program* level, which investigates the relationship between knowledge production for practice and university degree programs; the *organization* level, which focuses on organizational features such as the roles played by research centers on nonprofits and philanthropy; and the *community* level, which examines the connections between knowledge production and its external environment.

Program-level factors

In response to the rapid growth of the nonprofit sector in the United States and worldwide, degree programs in nonprofit and philanthropic studies expanded widely between the mid-1990s and the mid-2010s [18, 19]. The success of these programs depended on how effectively they equipped students with practical skills [20], especially for graduate students who came from or were expected to work in nonprofits [21]. To meet this expectation, nonprofit scholars were incentivized to produce more practical knowledge, even though other forces such as academic recognition and promotion standards pulled their attention toward theory building.

Organization-level factors

The organizational features favorable or unfavorable to practical knowledge production form another stream of factors. For example, universities with research centers focused on studying nonprofits and philanthropy are more connected to practitioners because these centers serve as crucial hubs for facilitating scholar-practitioner collaboration and knowledge transfer [17, 22]. On the negative side, the university tenure system and publication processes of many peer-reviewed journals are known as unfavorable to practical knowledge because their purposes are primarily academic and oriented toward theory-building [1, 23].

Community-level factors

Organizations are embedded in and influenced by their external environment, drawing personnel and resources from outside. From this perspective, organizations can be seen as “open systems” [24, pp. 87–106]. To be successful, an organization needs to assess and respond effectively to its external environment. In higher education, the success of a university also depends in part on how it responds to the needs of its external communities (e.g., initiatives aimed at reducing the local poverty rate of the institution’s vicinity) [25]. Universities can respond to and engage their external neighborhoods through numerous channels, such as communal participatory research [26] and service learning through curricular activities [27–29].

Connecting the dots: A framework of institutional logics for producing practical knowledge

Open- and closed-system logics

From an institutional perspective, the process of producing practical knowledge is influenced by a complex variety of factors, ranging from degree programs to environmental contexts. In this section, we propose a coherent framework from an institutional-logics perspective to explain how these factors work together to influence the knowledge production process.

In organizational sociology, institutional logics are “systems of cultural elements (values, beliefs, and normative expectations) by which people, groups, and organizations make sense of and evaluate their everyday activities, and organize those activities in time and space” [30, p. 1]. The specific definition of institutional logics varies by theorist, but the central focus of this concept is to interpret individual and organizational behaviors within a social and institutional context; the institutional context both regularizes behavior and offers opportunities to change [31, p. 102].

Drawing from literature on institutional logics and higher education, [32] identified two central logics in the field of US higher education: open-system and closed-system. The *open-system* logic treats universities and research disciplines as open systems in their engagement of various stakeholders (e.g., students, teachers, and practitioners) in learning and knowledge production. The *closed-system* logic assumes universities and research disciplines as “storehouses of knowledge” and emphasizes the authority of academic institutions and faculty in teaching and research. US higher education experienced a major shift of institutional logic from the closed-system to the open-system type after World War II [32, pp. 322–323]. Academic disciplines can also vary in terms of “openness.” For example, the applied social sciences usually adopt an open-system logic and usually respond to practical needs faster than theoretical social sciences [33].

By analyzing the factors influencing knowledge production, it is evident that all the conditions favorable for producing practical knowledge follow an open-system logic. They all facilitate exchange between academia and various outside stakeholders. For example, the degree programs emphasizing practical knowledge prepare graduate students for their professions, nonprofit research centers are founded to facilitate collaboration between scholars and practitioners, and universities friendly to practical knowledge respond to community issues through research and curricular activities.

By contrast, the *closed-system logic* emphasizes the authoritative roles of universities in knowledge production and focuses on academic interests that may not align with the interests of practitioners. For example, the primary readers of academic publications are scholars. Many of the research topics (e.g., overall structure of the nonprofit sector and methodology) help only with theory-building but not with problem-solving [10, p. 508]. Universities are evaluated and ranked by peers according to their academic performance, which largely depends on factors unaligned with the interests of practitioners, such as publications, research grants, and citations. The closed-system logic pulls universities towards serving academic interests and away from producing practical knowledge.

Combining the influencing factors and institutional logics, Table 1 summarizes our research framework and hypotheses. At each of the levels (program, organization, and community), the influencing factors can affect the production of practical knowledge through either of two institutional logics: the open-system logic, which connects universities to their external environments, or the closed-system logic, which insulates higher education and research from responding to practical needs.

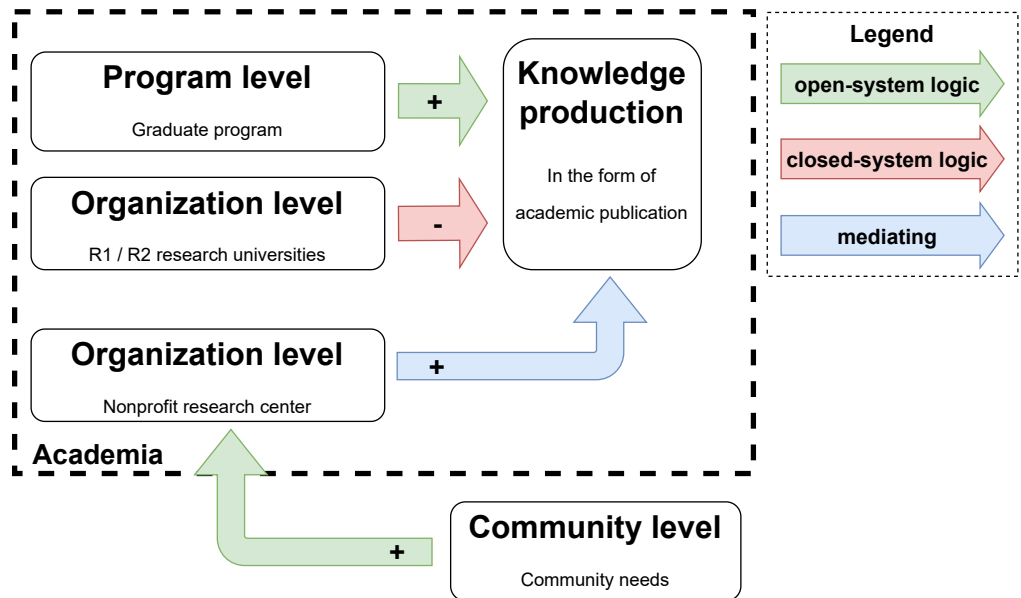
Table 1. PRODUCING PRACTICAL KNOWLEDGE: AN INSTITUTIONAL-LOGICS FRAMEWORK

		Institutional logics of universities		Operationalization
		Open-system	Closed-system	
Influencing factors	Program	Train students to solve practical problems	Train students to comprehend and build theories	Graduate program (+)
	Organization	Facilitate collaboration and knowledge transfer	Serve academic system and tenure process	Nonprofit research centers (+), Research universities (-)
	Community	Respond to community needs	Operate as academic ivory towers	Poverty rate at institutional location (+)

Mediating role of research centers: Shifting logics between community and academia

Producing knowledge in the form of academic publications is a primary function of academia. How, then, can the demands of external communities be internalized by academic institutions? Researchers suggest the need for channels for “shifting logics” and “cultural repackaging” (repackaging the culture of one system to be accepted by the other) in higher education [32]. As many studies have suggested, nonprofit research centers have been central players in translating practical needs into academic research [22,34–37]. Fig 1 illustrates the possible logic-shifting role of nonprofit research centers: these centers can act as mediators enhancing the influence of community needs on knowledge production for practice.

Fig 1. Mediating role of research centers: Shifting logics from community to academia.



Testing theorization

Among the US universities with an emphasis on nonprofit management education, why some universities produce more practical knowledge on nonprofits and philanthropy than others? We draw the following hypotheses from the framework (i.e., Table 1) to respond to this question.

Hypothesis 1: Universities with *graduate programs* in nonprofit and philanthropic studies produce more practice-oriented scholarship because these programs prepare students for their professions and introduce more practice-oriented topics to faculty research agendas.

Hypothesis 2: *Research universities* produce less practical knowledge because of their emphasis on theory-building.

Hypothesis 3: Universities with *nonprofit research centers* produce more practical knowledge because these centers can facilitate the exchange between scholars and practitioners.

Hypothesis 4: Universities located in counties with a high *poverty rate* produce more practical knowledge on nonprofits and philanthropy because these communities demand more practical solutions.

We draw the following hypothesis of interaction to test the mediating role of nonprofit research centers illustrated in Fig 1.

Hypothesis 5: Nonprofit research centers can *mediate* the relationship between poverty rate and practical knowledge: For universities with nonprofit research centers, the influence of poverty rate on producing practical knowledge is more substantial than for those without.

Materials and methods

Data

We constructed datasets on U.S. universities and their publications on nonprofits and philanthropy from the following sources:

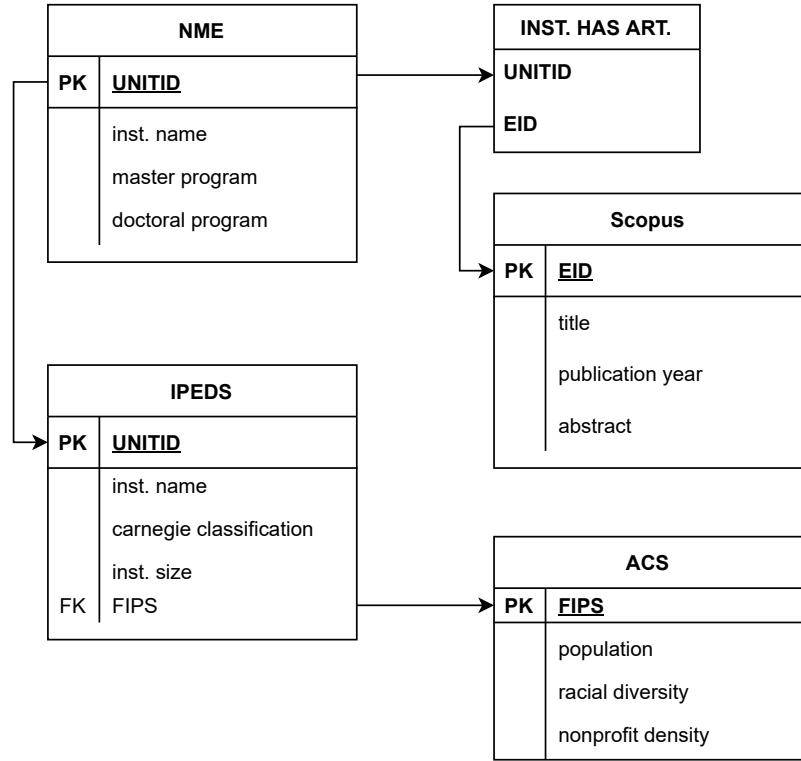
1. *Nonprofit Management Education, Current Offerings in University-Based Programs (NME)* is a well-known database developed and maintained by Mirabella et al. [18]. The NME documents the details of all degree and non-degree programs in nonprofit studies offered by US universities. We selected the universities and programs for analysis using this database. There are 401 lines of records from this source, and each line records a department, school, or university with a nonprofit program (degree or non-degree).
2. A list of *Nonprofit Research Centers (NRC)* is compiled from numerous articles introducing the research centers studying nonprofits and philanthropy and located in US universities [17, 18, 22, 34, 35, 37]. There are 114 lines of records from this source; each line records the names of a nonprofit research center and its hosting university.
3. *The Integrated Postsecondary Education Data System (IPEDS;* <https://nces.ed.gov/ipeds/>), which provides comprehensive details for US higher education institutions.
4. *Scopus*. Scopus (<https://www.scopus.com/>) is one of the most comprehensive bibliographic databases of academic articles [38]. From this data source, we retrieved journal articles on nonprofits and philanthropy authored by scholars from the NME-listed institutions. There are 14,039 lines of records from this data source, each line representing a published article. S1 Appendix details how this scholarship dataset is generated.
5. *American Community Survey* and *Small Area Income and Poverty Estimates* provide social and economic data at county level (i.e., population, poverty rate, and median household income).

To link data from different sources, the first step is to identify and disambiguate the unit of analysis. We use the unique ID from IPEDS (i.e., UNITID) to link and disambiguate universities recorded in different sources. The disambiguation process follows two primary rules. (1) Departments or schools under the same UNITID are combined. The underlying assumption is that different departments under the same UNITID should communicate about their academic and educational activities frequently or share very similar institutional contexts, (2) universities using the same name but with different campuses and different UNITIDs are disambiguated according to their addresses in the NME dataset (e.g., “Indiana University Bloomington” and “Indiana University Indianapolis”). The same rule applies to departments or schools on different campuses.

The IPEDS and ACS datasets are longitudinal, but the master dataset for analysis is an aggregation of historical data: the number of total articles that a university has published on nonprofits and philanthropy. Therefore, we need to decide which year of data we should pull from the IPEDS and ACS. The publication increase has become exponential since the early 2000s according to the distribution of all articles by year and existing studies [5, 18]. We therefore used the year in the middle (i.e., 2010) for the longitudinal datasets in analysis.

Fig 2 shows the simplified schema of the linked datasets (not showing all variables, for brevity's sake).

Fig 2. Simplified schema of linked datasets. PK = Primary Key, used to uniquely identify the records in a table. FK = Foreign Key, used to link records in different tables. NME = Nonprofit Management Education. IPEDS = The Integrated Postsecondary Education Data System. ACS = American Community Survey. FIPS = Federal Information Processing Standards (County Codes). EID = IDs for uniquely identifying publications. UNITID = IDs for uniquely identifying higher education institutions. INST. HAS ART. = Institution has articles.



Measures

To study the institutional process of knowledge production for practice, the units of analysis in this project are universities. All dependent and independent variables are measures of a university recorded in the NME dataset. To be clearer, we are studying why, among the US universities with an emphasis on nonprofit management education, some universities produce more practical knowledge on nonprofits and philanthropy than others?

Dependent variable

The operationalization of the dependent variable, the number of practice-oriented articles published by institutions, relies on coding an article as practice-oriented or not. We adopted a semi-automated approach to code the over six thousand research articles on nonprofits and philanthropy. For a human to code an article as practice-oriented, she identifies informative keywords and contexts from texts and then judges their relevance to practice. Our semi-automated approach simulates this process:

1. Extract topic keywords. We first extracted the keywords of primary topics from all the publications using a state-of-the-art topic-modeling algorithm (detailed in S1 Appendix). The topics are described by keywords extracted from the texts, and the keywords are ranked by their importance to a topic (i.e., the first keyword is the most informative for interpreting the meaning of a topic, etc.).
2. Determine the practice-oriented topics according to existing studies [8,10]. S1 Appendix has the details.
3. Assign topics to articles by calculating text similarity. Articles on practice-oriented topics are classified as practice-oriented scholarship. S1 Appendix has the technical details.
4. Validate and improve results. The semi-automated approach to coding may introduce errors. S1 Appendix details how we manually validate the coded results and improve the quality through an iterative process.

Through these steps we can finally calculate the dependent variable: The number of practice-oriented articles published by institutions. While the articles alone may not capture the entirety of practical information available to communities, they are widely recognized as accessible forms of knowledge output and remain an important source of practical information that is feasible to measure within the scope of this study.

Explanatory variables

Table 2 lists all the explanatory variables by levels of analysis (variables of interest are underlined). The control variables include: 1) the size of institution, 2) total number of articles on nonprofits and philanthropy (because a university will be likely to have more practice-oriented articles if it produces more publications); 3) basic county demographics pertaining to the location of each university examined in this study, such as total population.

Results

An overview of knowledge production for practice

Fig 3 presents the publications and author affiliations by year. The earliest journal article in our research database, titled “Industrial Cooperatives in the Ukrainian S.S.R.,” was published by Columbia University in the City of New York in 1951. The number of publications and universities with an NME focus has been steadily increasing since 2000, further strengthening the argument that nonprofit and philanthropic studies is an emerging research field [5, 18, 39]. Publications on practice-oriented topics have increased at a much faster pace than those that are theory-oriented. More than 200 practice-oriented articles were published annually since 2013, and the trend of increase is likely to continue by comparing to the publication trends in the 1990s and 2000s.

Table 2. Explanatory variables: Definition, data type, and source.

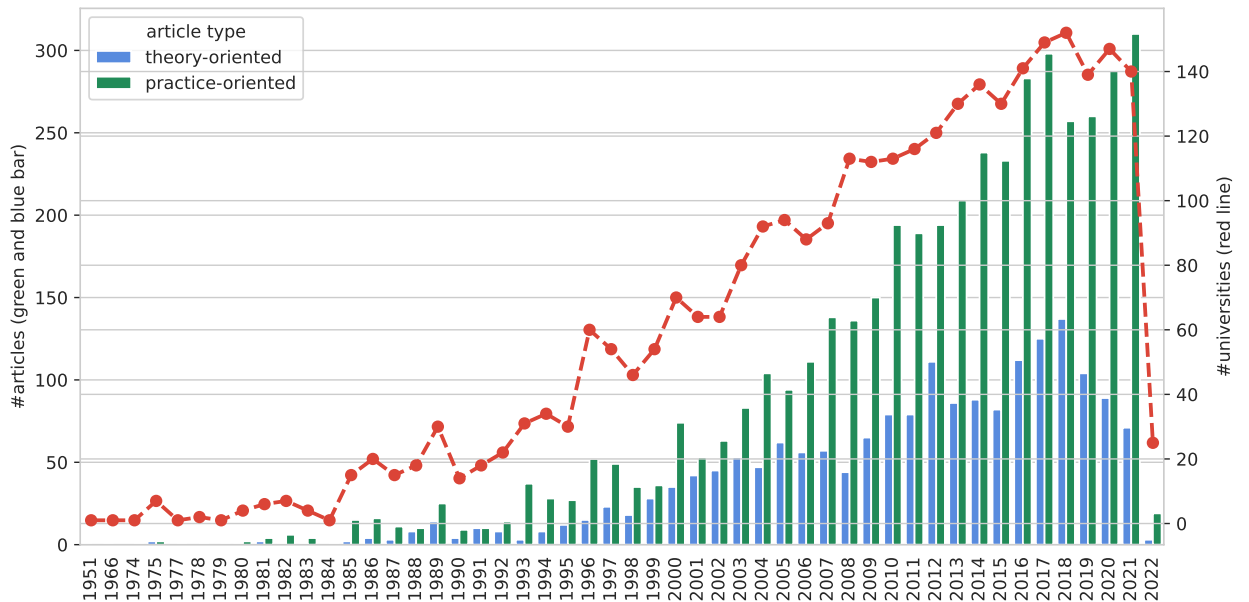
Variable label*	Explanation	Data type	Source**
<i>Program level</i>			
<u>Graduate</u> (+)	Whether a university has graduate-level programs on nonprofits and philanthropy	Binary	NME
<i>Organization level</i>			
<u>Research univ.</u> (-)	Whether a university is classified as R1 or R2 in the Carnegie Classification***	Binary	IPEDS
<u>NPS center</u> (+)	Whether a university has a research center on nonprofits and philanthropy	Binary	NRC
Inst. size (+)	Institution size, ranked from 1 to 5 according to total students enrolled for credit	Ordinal	IPEDS
#Total articles (+)	Total number of articles on nonprofits and philanthropy	Integer	Scopus
<i>Community level</i>			
<u>Poverty rate</u> (+)	Poverty rate by county in which universities are located	Continuous	SAIPE
Population (-)	Total population by county in which universities are located	Integer	ACS

*Variables of interest are underlined. Expected direction of coefficient is in parenthesis.

**See Materials and methods section for the details of the abbreviations.

*** The Carnegie Classification of Institutions of Higher Education is a framework for classifying the US colleges and universities. R1 and R2 indicate “Doctoral Universities – Very high research activity” and “Doctoral Universities – High research activity,” respectively. Refer to <https://carnegieclassifications.acenet.edu/> for details.

Fig 3. Distribution of publications and universities by year. Records for 2022 are incomplete because the research database was compiled in early 2022.



However, the annual number of publications on theory-oriented topics hovered around 150 since 2013 and did not suggest an upward trend.

The overall production of nonprofit scholarship distributes unevenly. Table 3 lists the details of the top 20 universities by total number of articles (a “university” is an entity with unique ID used by the IPEDS; records from different departments are aggregated by university). Most of these institutions are located in the Midwest and the East. On average, each university published 33.42 (*min* = 1, *max* = 218, *std* = 39.67) articles on nonprofits and philanthropy, and the top 20 most productive universities (8.47% of all the universities; Table 3) published 42.57% (i.e., 2,640 out of 6,201) of all the articles. A geovisualization and details of all the 236 U.S. universities with an NME focus can be accessed here: https://jima.me/us_nme.

Table 3. Nonprofit scholarship published by U.S. universities with NME focus.

UNITID	Inst. Name	Cent.	Grad.	#Art.	#Prac.	%Prac.
151111	Indiana University-Purdue University-Indianapolis	Yes	Yes	218	187	85.78%
151351	Indiana University-Bloomington	No	Yes	212	161	75.94%
215062	University of Pennsylvania	Yes	Yes	175	147	84.0%
166027	Harvard University	No	Yes	161	78	48.45%
123961	University of Southern California	Yes	Yes	157	101	64.33%
174066	University of Minnesota-Twin Cities	Yes	Yes	156	128	82.05%
236948	University of Washington-Seattle Campus	Yes	Yes	148	91	61.49%
170976	University of Michigan-Ann Arbor	No	Yes	139	102	73.38%
139959	University of Georgia	Yes	Yes	135	125	92.59%
139940	Georgia State University	No	Yes	127	108	85.04%
215293	University of Pittsburgh-Pittsburgh Campus	No	Yes	107	61	57.01%
130794	Yale University	No	Yes	107	64	59.81%
131469	George Washington University	No	Yes	107	71	66.36%
110635	University of California-Berkeley	Yes	Yes	106	69	65.09%
190150	Columbia University in the City of New York	No	Yes	101	55	54.46%
228723	Texas A & M University-College Station	Yes	Yes	100	94	94.0%
199120	University of North Carolina at Chapel Hill	No	Yes	97	63	64.95%
196413	Syracuse University	No	Yes	96	84	87.5%
199193	North Carolina State University at Raleigh	Yes	Yes	96	90	93.75%
134130	University of Florida	No	No	95	66	69.47%

Note: NME = Nonprofit management education; UNITID = unique ID in the Integrated Postsecondary Education Data System; IUPUI = Indiana University-Purdue University-Indianapolis. Each row shows the following items in order: unique ID in the Integrated Postsecondary Education Data System (ID), institution name (Inst. Name), whether the institution has a research center on nonprofit (Cent.), whether the institution has a graduate degree program on nonprofits (Grad.), the total number of peer-reviewed journal articles on nonprofits (#Art.), the total number of practice-oriented journal articles (#Prac.), and the percentage of practice-oriented articles (%Prac.).

The production of practical knowledge also follows an uneven pattern. Although 83.47% of these universities have one or more degree programs with an NME focus at graduate level, most of the nonprofit centers are located in the Midwest and the East. On average, each university published 24.23 (*min* = 1, *max* = 187, *std* = 29.78) practice-oriented articles, and the 20 most productive universities published 39.55% of all the practice-oriented articles (1,726 out of 4,364).

In terms of the proportion of practical knowledge, practice-oriented articles constituted 70.38% of all articles (4,364 out of 6,201). At the university level, an average of 76.48% (*min* = 18.18%, *max* = 100%, *std* = 19.28%) of total publications were practice-oriented.

Major topics

Table 4 lists the major topics extracted from nonprofit scholarship. The topics are represented by the most relevant keywords and ranked by the number of related articles. Among the 24 topics, 15 (62.5%) are practice-oriented. The top three practice-oriented topics focus on the motivation of volunteering (15.72%), fundraising and performance (14.04%), and altruism (10.56%). The top three theory-oriented topics focus on social protest and mobilization (7.54%), deliberation and democracy (5.45%), and regulatory environment in Sub-Saharan Africa (3.44%).

Table 4. Topic keywords and the number of corresponding articles.

	Top 5 keywords of topic	Practice-oriented	#Articles	%Articles
0	motivation, satisfaction, volunteer, inventory, esteem	Yes	1038	15.72%
1	funder, measurement, performance, grantee, accountability	Yes	927	14.04%
2	psm, altruism, motivation, motivational, job	Yes	697	10.56%
3	protest, mobilization, repression, movement, repertoire	No	498	7.54%
4	deliberative, deliberation, forum, democracy, multilevel	No	360	5.45%
5	alumnus, college, graduate, advancement, campus	Yes	242	3.67%
6	elasticity, subsidy, tax, price, charitable	Yes	241	3.65%
7	venture, entrepreneurs, entrepreneurial, enterprise, founder	Yes	235	3.56%
8	saharan, sub, africa, regulation, regulatory	No	227	3.44%
9	diversification, revenue, diversify, earn, portfolio	Yes	202	3.06%
10	protestant, catholic, religious, church, religion	No	199	3.01%
11	empathy, advertising, empathic, ad, persuasive	Yes	196	2.97%
12	ceo, chief, executive, board, director	Yes	180	2.73%
13	mcb, capitalism, economist, economics, economy	No	168	2.54%
14	ingos, ingo, hyperlink, nongovernmental, polity	No	155	2.35%
15	csr, company, corporate, promotional, credibility	Yes	153	2.32%
16	electoral, election, party, authoritarian, presidential	No	143	2.17%
17	contracting, contract, contractor, delivery, service	Yes	90	1.36%
18	katrina, hurricane, disaster, recovery, earthquake	Yes	57	0.86%
19	twitter, tweet, facebook, media, online	Yes	56	0.85%
20	cso, aid, reduction, foreign, civil	No	46	0.7%
21	ukraine, revolution, russian, russia, communist	No	45	0.68%
22	course, learning, learn, faculty, pedagogical	Yes	42	0.64%
23	auditor, audit, disclosure, disclose, accounting	Yes	19	0.29%

Note: PSM = Public service motivation [40]. Methods for generating these keywords are detailed in S1 Appendix, “A.2 Semi-automated approach to coding publications.”

Predicting knowledge production for practice

Table 5 describes the raw values of the explanatory and dependent variables. S1 Appendix tests the collinearity between explanatory variables and suggests a low statistical risk. All continuous variables are standardized using z-score for the regression analysis.

Table 6 presents the regression results for predicting knowledge production for practice. We build the models stepwise to test the robustness of estimation coefficients. Overall, the models show an exceptional predictive validity. All the models have an adjusted R^2 that is larger than 0.90, indicating that 90% of the dependent variable’s variance can be explained by the explanatory variables. The most significant contributor to the goodness of fit (i.e., R^2) is the number of total articles published by an institution, which makes sense because a university should produce more practice-oriented articles if it has more publications.

Table 5. Description of explanatory and dependent variables.

Variable	Obs. (%)	Mean (Std)	Min.	50%	Max.
<i>Graduate</i>					
Yes	197 (83.47%)				
No	39 (16.53%)				
<i>NPS center</i>					
Yes	45 (19.07%)				
No	191 (80.93%)				
<i>Research univ.</i>					
Yes	121 (51.27%)				
No	115 (48.73%)				
<i>Inst. size</i>					
1: Under 1,000	2 (0.85%)				
2: 1,000-4,999	28 (11.86%)				
3: 5,000-9,999	50 (21.19%)				
4: 10,000-19,999	65 (27.54%)				
5: 20,000 and above	91 (38.56%)				
<i>Poverty rate (%)</i>	236 (100%)	16.68 (5.12)	6.5	16.75	37.8
<i>Total articles</i>	227 (96.19%)	33.42 (39.67)	1	19	218
<i>Population</i>	236 (100%)	1,177,800 (1,875,634)	13,968	633,756.5	9,974,203
<i>Prac. article</i>	227 (96.19%)	24.23 (29.78)	1	12	187

Note: NPS = Nonprofit and philanthropic studies. Institution size shows the number of total students enrolled for credit in 2020.

Table 6. Predicting knowledge production for practice.

	(1)	(2)	(3)	(4)	(5)	(6)
<i>Program level</i>						
Graduate	0.055*	0.054*	0.060*	0.060*	0.070**	0.069**
	(1.7)	(1.7)	(1.9)	(1.9)	(2.1)	(2.1)
<i>Organization level</i>						
Research univ.			-0.088**	-0.088**	-0.080**	-0.072*
			(-2.3)	(-2.3)	(-2.1)	(-1.9)
NPS center		0.097*	0.10*	0.10*	0.090*	0.077
		(1.7)	(1.8)	(1.8)	(1.7)	(1.4)
<i>Community level</i>						
Poverty rate					0.047**	0.015
					(2.4)	(1.0)
<i>Shifting logics</i>						
Center × Poverty						0.13***
						(2.8)
<i>Controls</i>						
Inst. size	-0.0024	0.00090	0.022	0.022	0.012	0.015
	(-0.10)	(0.10)	(1.3)	(1.3)	(0.70)	(0.90)
#Total articles	0.97***	0.96***	0.97***	0.97***	0.97***	0.96***
	(21)	(20)	(20)	(20)	(21)	(21)
Population	-0.019	-0.023	-0.021	-0.021	-0.015	-0.014
	(-1.4)	(-1.5)	(-1.4)	(-1.4)	(-1.1)	(-1.1)
Observations	220	220	220	220	220	220
Adjusted R^2	0.937	0.938	0.938	0.938	0.940	0.943

Note: DV = number of practice-oriented articles. All continuous variables are normalized using z-score. t statistics in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < .01$

Interpreting the results without considering the interaction effect (i.e., Models 1—5)

At the program level, having a degree program at graduate level has a consistent and significant positive effect on producing practical knowledge (Hypothesis 1). According to Model 5, keeping all other variables equal, universities with graduate programs publish 2.08 more practice-oriented articles than those without (since all continuous variables are transformed using z-score in the regression analysis, the raw number of practice-oriented articles is calculated as $\beta \times StdDV$, where β is the coefficient of an explanatory variable, and $StdDV$ is the standard deviation of dependent variable, which is 29.78).

At the organization level, being a research university decreases the production of practical knowledge (Hypothesis 2). According to Model 5, keeping all other variables equal, an R1 or R2 research university publishes 2.38 fewer practice-oriented articles than those not classified as R1 or R2. Having a research center on studying nonprofits and philanthropy, however, can significantly increase knowledge production for practice (Hypothesis 3). According to Model 5, keeping all other variables equal, universities with NPS centers publish 2.68 more practice-oriented articles than those without.

At the community level, the poverty rate has a significant positive impact on producing practical knowledge, suggesting that universities located in disadvantaged counties publish more practice-oriented articles (Hypothesis 4). According to Model 5, keeping all other variables equal, an increase of 5.12% (i.e., one standard deviation) in a county's poverty rate will increase its universities' practice-oriented articles by 1.40.

Interpreting the results with interaction effect (i.e., Model 6)

Model 6 in Table 6 can be clarified by Eq 1, which shows how NPS centers mediate the relation between poverty rate and practical knowledge (Hypothesis 5). The model predicts that if a university does not have a research center focusing on studying nonprofits and philanthropy, the poverty rate of the university's county has an insignificant effect on producing practical knowledge. However, universities with NPS centers publish $0.13 \times Pvt$ (*poverty rate*) more articles than those without.

$$TotArt = \begin{cases} .069 \times Grad + (-.072) \times RU + Ctr & \text{if } Center = 0 \\ .069 \times Grad + (-.072) \times RU + .13 \times Pvt + Ctr & \text{if } Center = 1 \end{cases} \quad (1)$$

Robustness analysis

We tested the statistical robustness of the regression models and the robustness of operationalization. S1 Appendix has the details.

Discussion

We theorized a useful framework from the perspective of institutional logics to explain why some universities produce more practice-oriented articles in nonprofit studies than others. According to this framework, knowledge production follows the logics of both closed and open systems. A closed-system logic focuses on theory-building in academia, while an open-system logic calls for responding to external environments. For producing practical knowledge, channels that can repackage the needs of open systems to be accepted by closed systems are especially valuable. In testing this theorization, we found that being an R1 or R2 research university (i.e., a closed-system logic) can decrease the number of practice-oriented publications. However, having graduate degree

programs with an emphasis on nonprofit management, hosting research centers focusing on nonprofit studies, and being located in disadvantaged communities (i.e., open-system logic) can increase the production of practical knowledge. Research centers on nonprofit studies can serve as channels for logics shifting and cultural repackaging; these centers can mediate the influence of community needs on knowledge production, so that universities with nonprofit research centers become more responsive to solving community issues. The empirical results demonstrate strong robustness across various statistical and research design tests. These findings, along with the theoretical framework proposed, are also valuable references for other interdisciplinary fields of social science.

Practical implications of the framework

The theoretical framework of this study provides compelling information about factors associated with the production of practice-oriented knowledge in nonprofit studies across different universities. In general, efforts with an open-system logic are key to producing more practical knowledge. This study empirically confirms the effectiveness of two types of such efforts within universities: graduate programs with an emphasis on nonprofit management, and research centers on nonprofit studies.

More initiatives with an open-system logic can be pursued within universities: service-learning curricula, continuing education programs, and outreach newsletters, for example. However, to be culturally accepted by universities, these efforts have to be repackaged. As Lounsbury and Pollack suggested in their study of service learning in US higher education, the efforts aimed at bringing novel values into universities also must be recognized under existing conventions, which usually carry a closed-system logic [32].

Channels that can shift the logics and repackage the cultures are key to bridging open and closed systems. Numerous qualitative studies suggest that research centers on nonprofit studies can serve this role because a central rationale of such centers is to facilitate exchange between scholars and practitioners [17, 34, 36]. Scholars further suggested that connecting universities with local communities and providing entrepreneurial spaces for faculty members are two primary functions of these research centers [35, pp. 15–17]. This study empirically confirms these observations: for universities with NPS research centers, external environment has a more substantial effect on these institutions' knowledge production for practice.

Researchers also noted that traditional university structures have absorbed several nonprofit research centers in the past decade, suggesting that such a trend may represent either the successful institutionalization of this research field or the centers' loss of independence [35, p. 20]. Based on our analysis, we lean to the positive side: it is beneficial for the nonprofit research centers to step closer to the closed system so that they can better serve their logic-shifting and cultural-repackaging roles.

Matching research priorities between scholars and practitioners

Even when scholars' and practitioners' interests substantially overlap, their research priorities can differ substantially [8]. For example, the management of volunteers is among practitioners' highest priorities, but that subject is marginalized on nonprofit scholars' research agenda [8, p. 301]. The rankings of research topics in Table 4 are almost consistent with those surveyed in the early 1990s [8], while practitioners' needs may already have changed, and they may have more interest in newer topics such as the application of information technologies, which is absent from our list, and online social networks, which is ranked only 20th out of 23 on our list.

Practical needs are only one of the many factors that determine a scholar's research priorities. Matured research paradigms may carry more weight in deciding research

agenda [41]. Therefore, research topics with established theoretical frameworks can generate publications more easily than those without—the so-called “puzzle-solving” process in knowledge production. Table 4 supports this point. Those researching the most productive topics can build their research primarily on paradigms from psychology, finance, and management—the areas where more research paradigms are shared and consensus level is high [42]. For research topics with less established theoretical paradigms, such as social enterprise, fewer articles are published.

Therefore, knowledge production for practice should be examined in terms not only of volume but also of priorities. Practitioners’ pressing concerns must be reflected and prioritized in timely fashion on scholars’ agendas, and institutions for shifting logics are essential channels for this task.

Limitations and future directions

This study uses institutional logics as its primary theoretical lens. Therefore, it focuses on institutional factors and external environments rather than on individuals. Future studies can explore how individual-level factors, such as personality traits and social networks, can influence the knowledge production process.

Regarding the research design of this study, a major limitation is the operationalization of “practical knowledge.” First, because we use research topics as the instrument for coding article abstracts, it is possible that an article labeled as practice-oriented is a theory-building piece. Moreover, because all the research topics are extracted from academic scholarship, they may reflect the research interests only of scholars, not practitioners.

For future projects, the application of new technologies such as machine learning and cross-language modeling offers promising possibilities [43]. According to our assessment, scholarship on practical topics still predominates in terms of volume in our research field. However, we have limited information to evaluate the practical impact of these articles. Data sources tracking, for example, citations in policy documents, could be used to create direct outcome measures. Furthermore, practitioners may rarely pick up academic scholarship directly. The publishers’ paywall is one reason, but a more important reason may be the lack of a database platform where practitioners can look up scholarship according to their interests and communicate their priorities. Such a platform could be an important venue for sharing knowledge between practitioners and scholars.

Lastly, while this study offers useful insights into some of the factors that influence the production of practice knowledge, it is crucial to recognize that there are likely additional factors not addressed in the current paper. While the framework presented is grounded in empirical evidence, it should be considered as a preliminary foundation rather than a definitive conclusion. Future endeavors should incorporate a broader range of nuances and complexities when investigating the process of generating practical knowledge.

Supporting information

S1 Appendix. Methods and robustness analysis.

Acknowledgments

We thank Roseanne M. Mirabella and Benjamin J. Lough for generously sharing their datasets and insights. We thank Brenda K. Bushouse, Huafang Li, Peter Weber, and Sydney Wilburn for their kind and constructive comments. We thank the attendees of

the 2022 ARNOVA Annual Conference and the cloud computing resources through the Texas Advanced Computing Center at UT Austin [44]. We thank Kate Hartford for editing and proofreading.

477
478
479

References

1. Van de Ven AH, Johnson PE. Knowledge for Theory and Practice;31(4):802–821. doi:10.2307/20159252.
2. Fixsen D, Blase K, Naoom S, Duda M. Implementation Drivers: Assessing Best Practices;.
3. Fixsen DL, Naoom S, Blase K, Friedman R, Wallace F. Implementation Research: A Synthesis of the Literature;.
4. Wandersman A, Duffy J, Flaspohler P, Noonan R, Lubell K, Stillman L, et al. Bridging the Gap Between Prevention Research and Practice: The Interactive Systems Framework for Dissemination and Implementation;41(3):171–181. doi:10.1007/s10464-008-9174-z.
5. Ma J, Konrath S. A Century of Nonprofit Studies: Scaling the Knowledge of the Field;29(6):1139–1158. doi:10.1007/s11266-018-00057-5.
6. Hall PD. A Historical Overview of Philanthropy, Voluntary Associations, and Nonprofit Organizations in the United States, 1600–2000. In: Powell WW, Steinberg R, editors. The nonprofit sector: A research handbook. Yale University Press;. p. 32–65.
7. Mirabella RM. University-Based Educational Programs in Nonprofit Management and Philanthropic Studies: A 10-Year Review and Projections of Future Trends;36(4):11S–27S. doi:10.1177/0899764007305051.
8. Brudney JL, Kluesner TM. Researchers and Practitioners in Nonprofit Organization and Voluntary Action: Applying Research to Practice?;21(3):293–308. doi:10.1177/089976409202100307.
9. Feeney S. Introduction;29(1):5–10. doi:10.1177/0899764000291001.
10. Bushouse BK, Sowa JE. Producing Knowledge For Practice Assessing NVSQ 2000-2010;41(3):497–513. doi:10.1177/0899764011422116.
11. Vrentas C, Freiwirth J, Benatti S, Hill C, Yurasek A. Bridging the Divide Between the Research and Practitioner Sectors: A New Collaborative Initiative Between the Alliance for Nonprofit Management and the Association for Research on Nonprofit Organizations and Voluntary Action Pracademics Section;8(1).
12. Macduff N, Netting FE. Lessons Learned from a Practitioner-Academician Collaboration;29(1):46–60. doi:10.1177/0899764000291004.
13. Taylor R, Torugsa NA, Arundel A. Leaping Into Real-World Relevance: An “Abduction” Process for Nonprofit Research;47(1):206–227. doi:10.1177/0899764017718635.
14. Allison L, Chen X, Flanigan ST, Keyes-Williams J, Vasavada TS, Saidel JR. Toward Doctoral Education in Nonprofit and Philanthropic Studies;36(4):51S–63S. doi:10.1177/0899764007305054.

15. Jackson SK, Guerrero S, Appe S. The State of Nonprofit and Philanthropic Studies Doctoral Education;43(5):795–811. doi:10.1177/0899764014549056.
16. Bushouse BK. Leveraging Nonprofit and Voluntary Action Research to Inform Public Policy;45(1):50–73. doi:10.1111/psj.12195.
17. Lough BJ. Examining the Normative Operations of Nonprofit Academic Centers;11(1). doi:10.18666/JNEL-2020-9813.
18. Mirabella R, Hoffman T, Teo TK, McDonald M. The Evolution of Nonprofit Management and Philanthropic Studies in the United States: Are We Now a Disciplinary Field?;9(1). doi:10.18666/JNEL-2019-V9-I1-9598.
19. Mirabella R, Hvenmark J, Larsson OS. Editors' Notes;12(3):vii+.
20. Mirabella RM, Wish NB. Educational Impact of Graduate Nonprofit Degree Programs: Perspectives of Multiple Stakeholders;9(3):329–340. doi:10.1002/nml.9309.
21. Kuenzi K, Stewart A, Walk M. Nonprofit graduate education: Who gets the degree and why?;26(1):11–30. doi:10.1080/15236803.2018.1482107.
22. Rooney PM, Burlingame DF. Build It and They Will Come! Or, Built to Last? Key Challenges and Insights into the Sustainability of Nonprofit and Philanthropy Programs and Centers;10(4):414–428. doi:10.18666/JNEL-2020-10821.
23. Bushouse BK, Jacobson WS, Lambright KT, Llorens JJ, Morse RS, Poocharoen Oo. Crossing the Divide: Building Bridges between Public Administration Practitioners and Scholars;21:i99–i112. doi:10.1093/jopart/muq063.
24. Scott WR. Organizations and organizing: rational, natural, and open systems perspectives. 1st ed. Pearson Prentice Hall;.
25. Hearn JC, Dinger RBH. Scanning the University's External Environment;56(4):419–445. doi:10.1080/00221546.1985.11780702.
26. Benson L, Harkavy I, Puckett J. An Implementation Revolution as a Strategy for Fulfilling the Democratic Promise of University-Community Partnerships: Penn-West Philadelphia as an Experiment in Progress;29(1):24–45. doi:10.1177/0899764000291003.
27. Carpenter H. How We Could Measure Community Impact of Nonprofit Graduate Students' Service-Learning Projects: Lessons from the Literature;17(1):115–131.
28. Hatcher JA, Studer ML. Service Learning and Philanthropy: Implications for Course Design;0:0–0. doi:10.1080/00405841.2015.977656.
29. McDougle LM, Li H. Service-Learning in Higher Education and Prosocial Identity Formation; p. 08997640221108140. doi:10.1177/08997640221108140.
30. Haveman HA, Gualtieri G. Institutional Logics;doi:10.1093/acrefore/9780190224851.013.137.
31. Thornton PH, Ocasio W. Institutional Logics. In: The Sage Handbook of Organizational Institutionalism;. p. 99–128.
32. Lounsbury M, Pollack S. Institutionalizing Civic Engagement: Shifting Logics and the Cultural Repackaging of Service-Learning in US Higher Education;8(2):319–339. doi:10.1177/1350508401082016.

33. Gouldner AW. Theoretical Requirements of the Applied Social Sciences;22(1):92–102. doi:10.2307/2088771.
34. Sommerfeld DH, Austin MJ. Mapping the Research Priorities of Nonprofit Sector Research Centers;4(1):n/a.
35. Weber PC, Brunt C. Mapping NACC Centers: The Past and Future Trajectory of Academic Nonprofit Centers;0(0). doi:10.18666/JNEL-2020-10241.
36. Young DR. Games Universities Play: An Analysis of the Institutional Contexts of Centers for Nonprofit Study. In: O’Neill M, Fletcher K, editors. Nonprofit Management Education: U.S. and World Perspectives. Greenwood Publishing Group;. p. 119–136.
37. Weber P, Brunt C. Building Nonprofit Management Education in the US: The Role of Centers in Supporting New Academic Disciplines; p. 1–26. doi:10.20899/jpna.8.1.1-26.
38. Baas J, Schotten M, Plume A, Côté G, Karimi R. Scopus as a curated, high-quality bibliometric data source for academic research in quantitative science studies;1(1):377–386. doi:10.1162/qss_a.00019.
39. Shier ML, Handy F. Research Trends in Nonprofit Graduate Studies A Growing Interdisciplinary Field;43(5):812–831. doi:10.1177/0899764014548279.
40. Perry JL. Bringing Society In: Toward a Theory of Public-Service Motivation;10(2):471–488. doi:10.1093/oxfordjournals.jpart.a024277.
41. Kuhn TS. The Structure of Scientific Revolutions. Second edition, enlarged ed. International encyclopedia of unified science. Foundations of the unity of science, v. 2, no. 2. University of Chicago Press;.
42. Ma J, Bekkers R. Consensus Formation in Nonprofit and Philanthropic Studies: Networks, Reputation, and Gender; p. 08997640221146948. doi:10.1177/08997640221146948.
43. Ma J. Neutral, non-disruptive, and native: Why do Chinese nonprofit scholars cite English articles?;. Available from: <https://osf.io/eh7ga/>.
44. Keahey K, Anderson J, Zhen Z, Riteau P, Ruth P, Stanzione D, et al. Lessons Learned from the Chameleon Testbed;. p. 219–233. Available from: <https://www.usenix.org/conference/atc20/presentation/keahey>.

Online Appendix

INSTITUTIONAL FACTORS INFLUENCING KNOWLEDGE PRODUCTION FOR PRACTICE: EVIDENCE FROM NONPROFIT STUDIES

Full article available at <https://osf.io/qj85m>

A	Methods	2
A.1	Nonprofit scholarship by U.S. universities with an NME focus	2
A.2	Semi-automated approach to coding publications	3
A.2.1	Extract topics and topic keywords	3
A.2.2	Determine practice-oriented topics	4
A.2.3	Code articles using topic keywords	5
A.2.4	Evaluate coding results	5
A.2.5	Remove non-relevant articles	6
B	Robustness analysis	6
B.1	Statistical robustness	6
B.2	Measure robustness: Community needs	7

A Methods

A.1 Nonprofit scholarship by U.S. universities with an NME focus

We followed these steps to compile a dataset of the nonprofit scholarship published by universities with a nonprofit management education (NME) focus.

1. Obtained a list of authors who published at least once in nonprofit journals, treating these researchers as “nonprofit scholars” (Walk & Andersson, 2020). This step generated 17,945 authors from all over the world.
2. These nonprofit scholars may publish articles on nonprofits and philanthropy (or articles that are not relevant to the field) elsewhere. Therefore, we retrieved all the articles published by these authors, generating 307,935 publications.
3. Refined these articles to those with affiliations in the NME dataset (i.e., U.S. universities with an NME focus). This step reduced the literature pool to 101,580 articles.
4. These articles, even though written by nonprofit scholars with affiliations with an NME focus, are still too broad and might be irrelevant to the field. We further restricted the articles to those having at least one of these keywords in their abstracts according to the keyword lists used by numerous studies (Ma & Konrath, 2018; Shier & Handy, 2014; Smith, 2013): “nonprofit,” “non-profit,” “third sector,” “donation,” “donate,” “giving,” “philanthrop,” “prosocial,” “altrui,” “charity,” “charitable,” “volunteering,” “volunteerism,” “NGO,” “nongovernm,” “civil socie.”

The final dataset has the bibliographical details of 6,201 unique articles published between 1951 and 2022, from 245 U.S. universities with an NME focus.

39 **A.2 Semi-automated approach to coding publications**

40 The semi-automated approach identifies three types of information essential in human coding: (1)
41 informative keywords that present the articles' main ideas, (2) the keywords' semantic contexts,
42 and (3) the relevance of keywords and contexts to practice-oriented topics.

43 *A.2.1 Extract topics and topic keywords*

44 For a computer to analyze texts, the texts need to be converted to vectors, a process often referred
45 to as "encoding." There are primarily two approaches to encode texts: the Bag-of-Words
46 approach, which relies on word frequency; and word semantics, which tries to semantically map
47 words in high-dimensional vector spaces (Jurafsky & Martin, 2022; Ma, 2021). We adopted the
48 latter because it is one of the most recent advances in computational linguistics and the basis for
49 many state-of-the-art (SOTA) natural language processing algorithms.

50 We used the SOTA algorithm devised by Angelov (2020) to extract the topics from the
51 scholarly articles. These topics are represented using keywords. Two technical caveats warrant
52 attention:

- 53 1. The number of topics. Running the algorithm with different parameters can generate
54 different numbers of topics, but how many topics make the "correct" number? Defining the
55 "ground truth" of research topics is hardly possible. According to Frumkin (2002, p. 25), it
56 is possible to group the modeled topics into four main categories in order to establish
57 content validity (i.e., service delivery, social entrepreneurship, civic and political
58 engagement, and values and faith). To ensure discriminant validity, the representative
59 keywords within each category should be as far apart as possible in the trained semantic
60 space. For example, if the modeled topics are divided into four categories, the word
61 "political" should be closely associated with one of the four topic vectors, but distinct from
62 the other three. An ideal classification of research topics would produce values such as
63 [0.98, 0.99, 0.92, 0.99]. To evaluate these values, three criteria can be used: 1) the four

64 numbers should be evenly distributed, which can be assessed using a variant of the
65 Herfindahl–Hirschman index; 2) the average of the four numbers should be high; and 3) as
66 many topics as possible should be retained in order to retain more information and better
67 differentiate articles. The harmonic mean of these three criteria was calculated to determine
68 the optimal number of topics. Based on these strategies, we identified 29 topics from the
69 corpus.

- 70 2. The number of keywords. The keywords are not equally helpful, and less informative
71 keywords may introduce noises. The keywords for each topic are ranked according to their
72 centrality to the contents of topics (i.e., the first keyword is more informative than the
73 second keyword in determining what a topic is about; the second is more informative than
74 the third, and so on). The algorithm returns 50 keywords and their centrality values for each
75 topic. This technical caveat is important in informing our analysis, as Appendix A.2.3
76 elaborates.

77 *A.2.2 Determine practice-oriented topics*

78 It can be hard to draw the line between theoretical and practical scholarship because practitioners
79 and scholars may see the distinction differently. Even among scholars, interpretations can vary
80 because of differences in disciplinary background and research context.

81 Table A1 lists all the themes found by the authors of the two most-cited articles on this
82 research topic and show how these topics are coded in respective studies (Brudney & Kluesner,
83 1992; Bushouse & Sowa, 2012). The table shows many inconsistencies, especially for topics
84 concerning the political aspects of nonprofits, government-nonprofit relations, interorganizational
85 relations, and international and macro perspectives. Some similar topics are coded differently in
86 different studies. For example, “government-voluntary sector relations” is labeled as
87 theory-oriented in Brudney and Kluesner (1992), while “government-nonprofit relations” is
88 labeled as practice-oriented in Bushouse and Sowa (2012). These differences mainly reflect the
89 authors’ disciplinary backgrounds and contexts (e.g., sociology and political science versus public

90 administration and management). Therefore, when coding the extracted topics, we used Table A1
91 as a reference but also considered the disciplinary background of the keywords.¹

92 *A.2.3 Code articles using topic keywords*

93 The next step is to calculate the textual similarity between articles' abstracts and topic keywords
94 using the methods applied in Kozlowski et al. (2019), Kusner et al. (2015), Ma (2022), and Ma
95 and Bekkers (2023). The topic with the greatest similarity to an abstract is assigned as the theme
96 of that article. The article is then labeled as practice-oriented or not according to the topic's
97 category.

98 In a nutshell, we coded the research articles using topic keywords as an instrument. Readers
99 may naturally wonder, since each article is already grouped into one of the topics at the preceding
100 step (i.e., "A.2.2 Determine practice-oriented topics"), why not directly assign the practice label
101 to respective articles? Why do we need to add a step calculating the similarity between topic
102 keywords and research abstracts? There are two principal reasons. 1) As Appendix A.2.1
103 describes, not all keywords are equally informative, and less informative keywords can introduce
104 errors. Therefore, we only kept keywords with centrality values above the 50th percentile (i.e., the
105 first 25 keywords) at this step. 2) As Appendix A.2.5 describes, some articles may be grouped
106 into non-relevant topics. These topics must be excluded from analysis, and some articles need to
107 be reassigned to nonprofit-relevant topics.

108 *A.2.4 Evaluate coding results*

109 We randomly selected 296 records from the 6,603 total abstracts to manually estimate the quality
110 of the dataset and coding results (confidence level $\approx 95\% \pm 5.6\%$). Among the 296 records,
111 21.62% of them (64 articles) were not relevant to nonprofit studies. For the 232 articles that were
112 relevant to nonprofits and philanthropy, the consistency of coding between human and algorithm
113 was 84.05% (195 out of 232 records).

114 A.2.5 Remove non-relevant articles

115 The dataset contains many non-relevant articles (21.62%, with a confidence level $\approx 95\% \pm 5.6\%$).
116 Although our initial analysis with all topics showed a fair instrumental validity, we could still
117 improve the data quality by removing noisy references.

118 The 64 non-relevant articles manually checked out primarily include keywords or themes such
119 as “caregiver,” “organ donor,” and health industries. These articles correspond to the five
120 non-relevant topics extracted in Appendix A.2.1. We can exclude these articles (Table A2) from
121 further analysis.

122 In total, 387 articles were excluded at this step, and the final dataset had 6,201 articles for
123 further analysis. We randomly selected 117 records from the excluded articles and 163 records
124 from the nonprofit studies-relevant articles to manually validate the quality of the final dataset.
125 Table A3 shows the validation results. The precision is 82.82% ($\frac{TruePositive}{TruePositive+FalsePositive}$, i.e.,
126 articles identified as relevant to nonprofit studies really are relevant), and recall is 90.60%
127 ($\frac{TruePositive}{TruePositive+FalseNegative}$, i.e., articles that should be identified as relevant to nonprofit studies are
128 categorized as such).

129 B Robustness analysis

130 B.1 Statistical robustness

131 Table B4 shows the correlation matrix of continuous explanatory variables and suggests that the
132 poverty rate, one of the primary variables of interest, has only weak correlations with other
133 variables. The values of the variance inflation factor of all the explanatory variables is less than 2
134 ($Mean = 1.47$). Taken together, the risk of multicollinearity is low, and the estimation coefficients
135 should be statistically robust.

136 **B.2 Measure robustness: Community needs**

137 Poverty rate is an intuitive measure of community needs with the assumption that disadvantaged
138 communities should have more social issues that need to be addressed through research. An
139 alternative measure of a community's well-being is median household income (MHI). Unlike the
140 poverty rate, which measures the percentage of individuals in a community living below the
141 poverty line, MHI is a measure of the income of a community's households. It is not affected by
142 changes in the number of individuals in a household, whereas poverty rate is. As a result, MHI
143 may be a more robust measure for getting a complete and accurate picture of a community's
144 well-being, and may be a better indicator of community needs in some cases.

145 Table B5 shows the results of running the main regressions by replacing poverty rate with
146 MHI. The results are largely consistent with those of the main regressions in Table 6, and the
147 coefficients in Model 6 show more statistical significance. According to the updated estimation
148 using MHI (i.e., Eq. 1), universities with NPS centers will publish $-0.082 \times MHI + 0.12$ more
149 articles on practice-oriented topics than those without.

$$TotArt = \begin{cases} 0.079 \times Grad + (-0.088) \times RU + (-0.035) \times MHI & \text{if } Center = 0 \\ 0.079 \times Grad + (-0.088) \times RU + (-0.117) \times MHI + 0.12 & \text{if } Center = 1 \end{cases} \quad (1)$$

Table A1: RESEARCH TOPICS IN BRUDNEY AND KLUESNER (1992) AND BUSHOUSE AND SOWA (2012)

		Practice	Theory	BK1992	BS2012
<i>Volunteers</i>					
1	Motivation, recognition, retention of volunteers	x		x	
2	Recruitment of volunteers	x		x	
3	Director of volunteer services	x		x	
4	Nontraditional volunteers	x		x	
5	Supervision and management of volunteers	x		x	
6	Human resource management / volunteer administration	x			x
<i>Professionalization</i>					
7	Professional skills	x		x	
8	Information technology	x			x
9	Governance / boards	x			x
10	Organization change and development	x		x	
11	Planning and evaluation of program	x		x	
12	Effectiveness/performance	x			x
13	Financial management	x			x
14	Accountability	x			x
15	Capacity building	x			x
16	Fund development / fundraising / marketing	x			x
17	Substantive areas	x		x	
<i>Political aspects</i>					
18	Political factors / empowerment	x		x	
19	Citizen participation		x	x	
20	Civic engagement/social capital		x		x
21	Advocacy	x			x
22	Citizen participation in self-help, coproduction		x	x	
<i>Government-nonprofit relations</i>					
23	Government-voluntary sector relations		x	x	
24	Government-nonprofit relations	x			x
<i>Interorganizational relations</i>					
25	Interorganizational relations		x	x	
26	Interorganizational relationship	x			x
<i>International aspects</i>					
27	International voluntary sector		x	x	
28	International development / microfinance	x			x
<i>Research</i>					
29	Information/literature sources		x	x	
30	Framing research questions		x	x	
31	Methods		x		x
<i>Macro perspectives of nonprofits and philanthropy</i>					
32	Voluntary associations / sector (general)		x	x	
33	Auspices/nature of the sector		x		x
34	Women and voluntary sector		x	x	
35	Structure of voluntary associations		x	x	
36	Philanthropy	x			x
37	Social policy	x			x
38	Faith-based organizations	x			x

Note: BK1992 = Brudney and Kluesner (1992); BS2012 = Bushouse and Sowa (2012). Using exact topic names from original studies. Text in italics indicates major themes and is re-categorized by current study. To read the table: in Line 24, for example, “government-nonprofit relations” is a topic labeled as practice-oriented in Bushouse and Sowa (2012).

Table A2: NON-RELEVANT ARTICLES BY TOPIC

	Top 5 keywords of topic	#Articles	%Articles
0	facility_nursing_chain_ownership_medicare	164	2.48%
1	caregiving_grandparent_caregiver_grandchild_caregive	78	1.18%
2	organ_procurement_consent_transplant_shortage	55	0.83%
3	covid_pandemic_berlin_gruyter_response	50	0.76%
4	stebbins_jurgen_grotz_horton_smith	40	0.61%

Table A3: VALIDATION OF THE CLASSIFICATION OF ARTICLES

		NPS relevant (validated)	
		Yes	No
NPS relevant (predicted)	Yes	135 (TP)	28 (FP)
	No	14 (FN)	103 (TN)

Note: T, F, P, and N represents True, False, Positive, and Negative, respectively. NPS = Nonprofit and philanthropic studies.

Table B4: CORRELATION MATRIX OF CONTINUOUS EXPLANATORY VARIABLES

	P. R.	I. S.	T. A.	Popu.
Poverty rate	1.0			
Inst. size	0.15	1.0		
#Total articles	0.086	0.54	1.0	
Population	-0.011	0.082	0.030	1.0

Table B5: CHECKING ROBUSTNESS: REPLACING POVERTY RATE WITH MEDIAN HOUSEHOLD INCOME

	(1)	(2)	(3)	(4)	(5)	(6)
<i>Program level</i>						
Graduate	0.055*	0.054*	0.060*	0.060*	0.077**	0.079**
	(1.7)	(1.7)	(1.9)	(1.9)	(2.4)	(2.4)
<i>Organization level</i>						
Research univ.			-0.088**	-0.088**	-0.097**	-0.088**
			(-2.3)	(-2.3)	(-2.6)	(-2.4)
NPS center		0.097*	0.10*	0.10*	0.11*	0.12**
		(1.7)	(1.8)	(1.8)	(2.0)	(2.1)
<i>Community level</i>						
MHI					-0.060***	-0.035*
					(-3.1)	(-1.8)
<i>Shifting logics</i>						
Center × MHI						-0.082*
						(-1.9)
<i>Controls</i>						
Inst. size	-0.0024	0.00090	0.022	0.022	0.019	0.021
	(-0.10)	(0.10)	(1.3)	(1.3)	(1.1)	(1.3)
#Total articles	0.97***	0.96***	0.97***	0.97***	0.98***	0.97***
	(21)	(20)	(20)	(20)	(22)	(22)
Population	-0.019	-0.023	-0.021	-0.021	-0.0059	-0.0082
	(-1.4)	(-1.5)	(-1.4)	(-1.4)	(-0.50)	(-0.60)
Observations	220	220	220	220	220	220
Adjusted R^2	0.94	0.94	0.94	0.94	0.94	0.94

Note: DV = number of practice-oriented articles; MHI = Median household income. All continuous variables are normalized using z-score. t statistics in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < .01$

References

- Angelov, D. (2020). Top2vec: Distributed representations of topics. *arXiv:2008.09470 [cs, stat]*.
- Brudney, J. L., & Kluesner, T. M. (1992). Researchers and practitioners in nonprofit organization and voluntary action: Applying research to practice? *Nonprofit and Voluntary Sector Quarterly*, 21(3), 293–308. <https://doi.org/10.1177/089976409202100307>
- Bushouse, B. K., & Sowa, J. E. (2012). Producing knowledge for practice assessing NVSQ 2000-2010. *Nonprofit and Voluntary Sector Quarterly*, 41(3), 497–513. <https://doi.org/10.1177/0899764011422116>
- Frumkin, P. (2002). *On being nonprofit: A conceptual and policy primer*. Harvard University Press.
- Jurafsky, D., & Martin, J. H. (2022, January 12). *Speech and language processing* (3rd draft).
- Kozlowski, A. C., Taddy, M., & Evans, J. A. (2019). The geometry of culture: Analyzing the meanings of class through word embeddings. *American Sociological Review*, 84(5), 905–949. <https://doi.org/10.1177/0003122419877135>
- Kusner, M., Sun, Y., Kolkin, N., & Weinberger, K. (2015). From word embeddings to document distances. *International Conference on Machine Learning*, 957–966.
- Ma, J. (2021). Automated coding using machine learning and remapping the u.s. nonprofit sector: A guide and benchmark. *Nonprofit and Voluntary Sector Quarterly*, 50(3), 662–687. <https://doi.org/10.1177/0899764020968153>
- Ma, J. (2022). How does an authoritarian state co-opt its social scientists studying civil society? *VOLUNTAS: International Journal of Voluntary and Nonprofit Organizations*. <https://doi.org/10.1007/s11266-022-00510-6>
- Ma, J., & Bekkers, R. (2023). Consensus formation in nonprofit and philanthropic studies: Networks, reputation, and gender. *Nonprofit and Voluntary Sector Quarterly*, 08997640221146948. <https://doi.org/10.1177/08997640221146948>
- Ma, J., & Konrath, S. (2018). A century of nonprofit studies: Scaling the knowledge of the field. *VOLUNTAS: International Journal of Voluntary and Nonprofit Organizations*, 29(6), 1139–1158. <https://doi.org/10.1007/s11266-018-00057-5>
- Shier, M. L., & Handy, F. (2014). Research trends in nonprofit graduate studies a growing interdisciplinary field. *Nonprofit and Voluntary Sector Quarterly*, 43(5), 812–831. <https://doi.org/10.1177/0899764014548279>
- Smith, D. H. (2013). Growth of research associations and journals in the emerging discipline of altruistics. *Nonprofit and Voluntary Sector Quarterly*, 42(4), 638–656. <https://doi.org/10.1177/0899764013495979>

184 Walk, M., & Andersson, F. O. (2020). Where do nonprofit and civil society researchers publish?
185 perceptions of nonprofit journal quality. *Journal of Public and Nonprofit Affairs*, 6(1),
186 79–95. <https://doi.org/10.20899/jpna.6.1.79-95>