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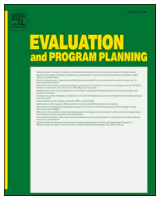

Exploring data use in nonprofit organizations

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ABSTRACT

Organizations around the world have increasingly employed data for a variety of purposes, and nonprofit organizations are no exception. This article reviews the use of data in nonprofit organizations, including the types of data collected and accessed, the motivations for data capture, and the barriers to systematic use of data. The literature shows that nonprofit organizations capture a variety of data, including public and financial data, performance measures, program evaluation data, and volunteer information. Organizations use these with diverse motivations such as program or organizational improvement, marketing, and accountability. Prominent barriers faced by organizations include challenges in identifying meaningful information, lack of technical ability, inability to prioritize data work, as well as external influences. The article highlights the challenges in synthesizing the available literature, with a high degree of fragmentation, including research from distinct intellectual traditions resulting in many disconnected constructs, measurements, and theories. Finally, the paper discusses challenges in the study of nonprofit data use and strives to provide guidance for future inquiry.

1. Introduction

There has been burgeoning interest in the use of data in for-profit business around the world. Famously, a 2012 article in the Harvard Business Review declared the position of data scientist "the sexiest job in the world," and only five years later The Economist echoed what Clive Humbly had said in 2006, declaring that "data is the new oil." Such enthusiasm is often followed by citation of the triumphs of data and algorithms, such as discussions of the success of Netflix's recommender system, Uber's ability to run randomized trials for discounts at scale, or the team at Etsy's ability to predict a well-fitting item of clothing for the heterogenous portion of the population that selects "medium." There are cases where quantification and data have created immense value in the for profit sector, for organizations with data as a core technology as well as a management tool (Brynjolfsson et al., 2011). Though nonprofit organizations are increasingly similar to their for-profit counterparts, including goals and competition (Mosley, 2020), scholars have maintained that nonprofit organizations are sufficiently unique, and merit bespoke solutions and management technologies (Beck et al., 2008; Newman & Wallender, 1978). Indeed, it is unlikely that the median nonprofit organization will ever have the acumen or information technology of the caliber described earlier. However, the field appears at a turning point, with increases in public data and progressively refined tools which have lowered barriers to entry.

Contemporary expectations and demands for data use in nonprofit organizations are a drastic departure from historical precedent. Previously, nonprofit organizations interest in data collection and understanding the performance of their programs was to further education in the helping professions, as skills and techniques were seen as applying across organizations (Brown, 2019), or, in the settlement house movement, such information was used in demonstrating the conditions of the client population (Alexander et al., 2010). The great society programs of the 1960's brought a major uptick in the evaluation of programs as well as the use of such information in decision making (Alkin & King, 2016). The 1990's saw the implementation of the Government Performance and Results Act, which moved government agencies toward higher levels of accountability and measurement, often with data demands pushed downward to nonprofit grantees. An analogous push in the nonprofit sector was seen when the United Way of America invested heavily in developing the capacity of local United Ways to effectively evaluate funded programs (Hendricks et al., 2008). The focus on value creation (particularly, demonstrating direct outcomes) has not been restricted to governments or federated organizations. A classification of foundations' philanthropic philosophies showed the view of

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"effectiveness" as the key component in their approach to funding. In pursuit of such effectiveness, it has been shown that over half of foundations require outcome information and two-fifths require formal evaluations (Ostrower, 2004, 2006). Nonprofit organization's practice of evaluating programs has grown since then, and in today's nonprofit landscape, some mix of performance measurement or program evaluation has become ubiquitous.

2. Goals of this study

When seeking to understand the use of data in nonprofit organizations, challenges are encountered as the topic has been addressed across distinct scholarly communities, including those focused on evaluation, nonprofit management, and the sphere of human computer interaction. Much is known about data use in the nonprofit context; however, it is largely cordoned off under titles including "evaluation use" or "performance management." This study aims to help coalesce this literature by taking a holistic perspective, synthesizing the existing knowledge related to data use in nonprofit organizations. In doing so, the review seeks to address three core questions:

1) What data are collected or used routinely by nonprofit organizations?
2) What motivates nonprofit organizations to collect these data?
3) What prevents organizations from engaging more deeply with data use?

These questions are of interest to a broad class of individuals who engage with nonprofit organizations, including managers, evaluators, consultants, researchers, and theorists. The first question addresses the types of information that are commonly captured by organizations. The second question explains why these data are collected, with an emphasis on managerial considerations. In the third question, we address the barriers faced by nonprofit organizations seeking to integrate data into their operations. We seek to inform managers and scholars alike, and that the answers to these three questions will assist managers in identifying areas that may be enriched by the use of data, as well as crucial stuck points experienced by other nonprofits. To assist scholars interested in nonprofit data use by providing a synthesis, we describe the most pressing issues; methodological and conceptual, that are preventing research in nonprofit data use from progressing further. Finally, the paper seeks to provide future directions in the investigation of data use in nonprofit organizations.

3. Approaches to studying nonprofit data use

One challenge encountered when approaching the study of nonprofit data use is the fractured state of the literature. There are those principally concerned with the management of nonprofit organizations, others largely drawing on frameworks for program evaluation, and finally scholars seeking to understand the role of technology in philanthropy and the nonprofit sector. While there is overlap among these, and each school of thought has provided insight into the data practices of nonprofit organizations, it makes synthesis challenging as they often draw on distinct classes of theories and motivations. Consequently, before addressing the main research questions, it is worth describing the intellectual traditions of each field.

The nonprofit management school is frequently motivated by what have been called "macro-organization theories," including neo-institutionalism and resource dependence theory, which have a rich history in nonprofit studies (Abzug, 1999). Typically, these theories lead researchers to focus on exchanges made to secure resources or forms of isomorphism (DiMaggio & Powell, 1983; Meyer & Rowan, 1977; Pfeffer, 1972). With respect to isomorphism, data use may be a legitimizing element, such that the use of data may signal to outsiders that the organization can be trusted, or that they may follow the lead of a larger, more successful, or more well-known organization, borrowing on their legitimacy when adopting data practices. Similarly, resource dependence theory has led researchers to consider data use as a simple exchange of autonomy for security, in the event that it is required by a funder or for public accountability. While not primarily a "macro--organization theory" other research has been motivated by the class of principal agent theories (Hendry, 2002), where data may be viewed as a way to verify impact and manage behavior. However, those familiar with the sector have acknowledged that principal agent theories are often ill-suited to deal with the complex environments in which nonprofit organizations administer programs and may even conflict with other processes (Benjamin, 2008; Ebrahim, 2005).

The evaluation community has addressed data use in nonprofit organizations from a different direction, focusing on evaluation as a component of organizational capacity. This has been encapsulated by the construct of evaluation capacity. While definitions of evaluation capacity differ widely by context (Compton & Baizerman, 2007), one definition in the context of nonprofit organizations defines evaluation capacity as an organization's ability to: define intended client outcomes, assess program performance, manage data and knowledge gained from evaluation activities to improve programs (Despard, 2016). The building of evaluation capacity in particular has garnered a great deal of scholarly interest (for example, "capacity building" has received special issues in *New Directions for Evaluation* in 2002, and *The Canadian Journal of Program Evaluation* in 2008).

Unlike the management and nonprofit communities, scholars of human computer interaction and related fields have been interested primarily in the complications encountered in the nonprofit sector when seeking to use information technology and manage data. Building on economic theories which suggest the nonprofit sector is a response to market failure (see e.g. Steinberg, 2006), Voida (2011) has suggested nonprofit organizations are "shapeshifters," insofar as they fill gaps created by other sectors and respond to changes to community context or need. This framework has been extended to the use of data and information technology, suggesting nonprofit organizations also respond to developing technological context (Voida, 2014).

4. What data are collected or used by nonprofit organizations?

Nonprofit organizations are often required to collect specific data, either directly by funders or an accrediting body, or implicitly by a rating agency (such as Charity Navigator, Charity Watch, or other agencies providing products to potential donors). In addition to creating value with information generated from within the organization (i.e., financial and program information), nonprofit organizations may use publicly accessible from local authorities, partners, or government agencies such the US Census Bureau. This section details the forms of data used by nonprofit organizations, a summary of which is provided in Table 1, along with uses for these data, and their strengths and weaknesses.

With the advent of so-called big data, nonprofit organizations have considered to what extent their work can benefit from such information. Big Data has been described as "large, diverse, complex, longitudinal, and/or distributed data sets generated from instruments, sensors, Internet transactions, email, video, click streams, and/or all other digital sources available today and in the future" (National Science Foundation, 2012), while others describe characteristics of big data: velocity, volume, and variety (McAfee & Brynjolfsson, 2012). Though such types of data hold potential value for many nonprofits, the ability to extract meaning from such records varies considerably and is not without challenge. Big data can present ethical issues, regardless of user (Brady, 2019). In addition to ethical concerns, Sharma and Joshi (2019) illustrates many challenges with big data in the disaster relief context, such as reliance on volunteers, reliably of information, and cost. Additionally, reliance on Big Data may also result in the marginalization of participants (Fink, 2018). The definition above shows that big data refers

Table 1
Summary of data sources accessed by nonprofits: strengths, weaknesses, and uses.

Data Types	Sample metrics	Strengths	Weaknesses	Use areas
Financial	Revenue by source Assets Costs and spending	Typically required Specific to the organization Of interest to donors and rating agencies	Does not reflect broader sector landscape May require additional data to be useful to managers	Financial and performance management Accountability Marketing and communications Accreditation Strategic planning
Volunteer	Total volunteers Turn-over Frequency and duration Contact information	Collected routinely Of interest to multiple departments Provides possible donors	Challenging to keep up to date Limited use cases	Marketing and communications
Public	Community needs Community assets Population trends	Publicly accessible (often free) Easily paired with other forms of data Articulates local context	Not available at micro-geographies May require technical skills	Marketing and communications Accountability Program evaluation
Participant	Total participants Demographics Need/Severity Service receipt Satisfaction Outcomes Outputs	Collected routinely Tied to clients engaged with agency Of interest to funders and donors	Self-report limitations Front-line staff may dislike data collection Often mandated	Marketing and communications Accountability Program evaluation Performance measurement Accreditation Strategic planning

primarily to format and volume. Our paper is focused on sources of data, reasons for data collection, problems, and theory building. For this reason, big data is not discussed explicitly, however, is often sourced in, and presents the same problems as, the data we discuss in this article.

4.1. Financial data

In the US, the internal revenue service (IRS) requires certain data to be reported by many nonprofits, such as basic financial indicators (i.e., Form 990), however the details depend on the particulars of the organization (larger organizations are required to submit more information). These data are valued by researchers and ratings agencies alike (DiMaggio et al., 2002), and unsurprisingly, information on expenses (on programs and other forms) have been found to be the most common types of data collected (over 90%) among samples of nonprofit organizations (Carman, 2007; Carman & Fredericks, 2008). Donors are commonly interested in financial information, such as ratios of administrative to program expenses. As a result, it is common for nonprofit rating agencies to include ratios of certain expenses as part of ranking or rating algorithms for nonprofits. However, this may place undue emphasis on arbitrary measures of effectiveness, as a financial ratio cannot capture every dimension of financial performance nor the organizational or programmatic environment (Ritchie & Kolodinsky, 2003). Examples of financial data include expenses and revenue by program, contributed revenue, asset composition, many of which may be paired with historical information.

4.2. Volunteer information

Many nonprofit organizations rely on volunteer labor to carry out their mission. In 2017, just over 25% of adults in the US volunteered at nonprofit organizations for a total of 8.8 billion hours of contributed labor (NCCS Team, 2020). Nonprofits routinely capture data on the duration and frequency of volunteering as well as measures of volunteer satisfaction. Dependence on volunteer labor makes managing contact and availability information necessary for many organizations. In many cases, the nonprofits most reliant on volunteers may be the least well-resourced and poorly equipped to manage volunteer information. In these cases, organizations may rely on what have been called “homebrew” databases; a mix of software, spreadsheets, and paper records (Eisinger, 2002; Voida et al., 2011). Further complications occur as volunteers may appear in more than one program within an organization, necessitating information sharing across programs, with which organizations commonly have difficultly (Voida et al., 2011, 2012). Volunteer information may include names, phone numbers, preferences, or the availability of volunteers.

4.3. Public data

Public data are informational resources that are available without restrictions, and there are often public data available that capture indicators of interest to nonprofit organizations (Johnson, 2015). Local research organizations, public-private partnerships, or other nonprofits may publish data that can be used to answer questions of interest for nonprofit organizations. In particular, data published by the US Census Bureau capture a range of information with the capacity to bring value to community based organizations (Johnson, 2015), and such aggregate data can be paired with program information to address more multi-dimensional questions (Daniel et al., 2021; Fischer et al., 2019). Despite acknowledging the capacity of these data to address their questions, nonprofit organizations often lack the technical expertise, and time, to engage in such data work, even after receiving training (Johnson, 2015). Additionally, nonprofit organizations may struggle to stay current on data availability, and some prefer pre-made reports rather than dealing with data themselves (Erete et al., 2016). Public data accessed by nonprofit organizations may include local demographic or economic information, such as the poverty or home vacancy rates by census tract, as well as the presence of other programs or organizations.

4.4. Participant data

Nonprofits and their funders are often interested in the characteristics of those seeking and enrolling in services as well as the outcomes of services. These are data about program participants including participant feedback and satisfaction, outputs, and outcomes whenever possible. These data are commonly required by funders and are often the focus of efforts to enhance accountability among nonprofits (Benjamin, 2008, 2013). These data have also been integral in the push toward performance management in public administration (Ebrahim, 2005; Kroll, 2015). Participant data remain among the most valued in the nonprofit sector, and guidance related to the collection of participant data are numerous, including the efforts by the United Way of American discussed earlier. However, they remain challenging for many nonprofits: survey results suggest approximately 90% record the number of people they serve, 80% of organizations track the demographics of consumers, and over half record output information (Carman, 2007; Carman & Fredericks, 2008). Client satisfaction a less common measure, and is sought by over half of organizations, as is anecdotal or narrative information about client experiences with services (Carman, 2007; Carman & Fredericks, 2008; Kim et al., 2019). More detailed participant information is often scarce, including aspects of relational work, control groups or untreated participants, or long-term (“impact”) outcomes (Benjamin, 2008; Carman & Fredericks, 2008; Hendricks et al., 2008).

Participant data may include details about program participants such as their age, family size, satisfaction with the services, or history of service receipt. These may also include outcomes, such as measures specific to the program's focus.

5. Why do nonprofit organizations collect data?

5.1. Accountability

Increasingly, nonprofits operate in grant and contract driven business models, or wish to retain donors. As such, performance measures or evaluative data offer ways for organizations to verify the delivery of services. In addition to a grant maker, organizations may often use program data to report their operations to their board or the public (Carman, 2007), and may be motivated by a desire to increase transparency with these groups (C. Lee & Clerkin, 2017). This motivation has also permeated professional materials, as an analysis of several guides to performance measurement for nonprofit organizations revealed reporting to external stakeholders as a reason for measurement mentioned in every document (Benjamin, 2013). Slightly different forms of data collection, such as organizational and program evaluation, are often done to satisfy accountability expectations as well, namely, funder requirements or informing boards (Carman, 2007; Eckerd & Moulton, 2011; Hoefer, 2000), and funders have acknowledged accountability as a motivation for financing the implementation of measurement systems (Benjamin, 2008).

The emphasis on measurement and data collection for accountability can be seen in several documents from nonprofit funders and consultants. Grantmakers for Effective Organizations recommends funders have nonprofits identify outcomes to measure progress and the ability to fund measurement efforts throughout the execution of their program (La Piana Consulting, 2010). Similarly, the United Way of America continues to encourage measurement for accountability among local United Ways. Reaffirming their commitment to outcome measurement by reprinting their 1996 guide in 2009, suggesting donors "want evidence that their gifts are improving the lives of the people United Ways touch. They want information about program outcomes…" (United Way Worldwide, 2009, p. 1). Candid (formerly GuideStar) introduced a tiered transparency program in 2013. The requirements of the lower tiers can be satisfied with an agency logo and contact details, while higher tiers require audited financial statement, a strategic plan, and a measure demonstrating progress and results. Though accountability remains a major driver in the continuation of funding, less clear is the relationship between high performance and expanded funding over time.

5.2. Marketing and communications

Similar to the historical use of data in social services (e.g., settlement houses) organizations may use public data in the creation of narratives to articulate problems in the local context or otherwise argue for increased support (Brudney et al., 2016; Erete et al., 2016). Likewise, performance measurement is often motivated by a desire to develop new funding relationships (Benjamin, 2013; C. Lee & Clerkin, 2017). Program evaluation often shares that motivation, as the results can be used for reporting to funders, as a promotional tool, or in procuring new funding (Carman & Fredericks, 2008; Hoefer, 2000). Nonprofit organizations that see evaluation and measurement as integral parts of their management frequently include the results in annual reports focused on educating stakeholders (Carman & Fredericks, 2010).

5.3. Improvement and management

Data from the sources described above can be used to manage organizations and improve operations or performance. As an example, a review of the literature identified 13 uses for performance measurement, many of which are of managerial importance including improving decision making, strategic planning, and evaluating employee performance (C. Lee & Clerkin, 2017). Collection of key data may be a perquisite for organizations interested in managing performance (Speckbacher, 2003), and the most common frequency of analysis is quarterly or monthly (Kim et al., 2019). There is likely to be interplay between program evaluation and performance measurement as many organizations report using program evaluation as a means to identify performance measures (Carman & Fredericks, 2008). Data collection can support evaluations of the organization as well as particular programs, and quality improvement is one of the primary motivations for organizational evaluation (Eckerd & Moulton, 2011). Similarly, organizations often report program augmentation (and formulating new programs) as a primary use for data collected through program evaluation (Carman & Fredericks, 2008; Hoefer, 2000). This evidence however, is contradicted by other survey research, in which program evaluation was motivated by a desire to verify impact (Fine et al., 2000).

The organization's relationship with data may vary by the substantive domain in which the organization operates (Benjamin et al., 2018), and the uses of data available to an organization may further depend on the independence of decision-making processes, including defining missions, target groups, results, and the strategies to achieve results (Verschuere & De Corte, 2014). For example, organizations that lack external incentives, may engage in planning more frequently (Kim et al., 2019). Though there is scant literature on the uses of data in nonprofit organizations, research has connected internal processes explicitly with measurement and data practice. The use of data to support approaches to growing nonprofit resilience against external threats is a recent area of growth (Young & Searing, 2022). Nonprofit organizations engaged in higher levels of performance measurement have been linked to higher levels of perceived effectiveness in strategic decision making (LeRoux & Wright, 2010), and organizations with fewer obstacles to implementing evaluation may encounter fewer management problems in general (Carman & Fredericks, 2010).

5.3.1. Performance measurement

Performance measurement is a system of measurement designed to present information in a form intended to be used routinely by managers. Performance measurement is often an attempt to create a "bottom-line" indicator (or set of indicators) which, ideally, allows managers to identify crises and assess performance without interrupting operations (C. Lee, 2021). Speckbacher (2003) suggests performance measurement involves a simplifying model of the firm which allows "a specific definition of the firm's primary objectives and how to measure these objectives" (p. 268) and Kroll (2015) suggests that performance measures appear in a quantitative and aggregated format, and are eventually made public through reports and databases.

Regular program monitoring is often an essential component of program development and improvement and intricately linked to resource availability (Coupet & Schehl, 2022; Minzer et al., 2014). Consequently, performance measurement has been the focus of much attention among community foundations, resulting in a number of frameworks including, but not limited to, the balanced scorecard, outcomes engineering, and results-oriented management and accountability, all of which focus on outcome measurement – "the program activities completed and the changes in the users as a result" (Benjamin, 2012. p. 443). Despite widespread attention, pre-existing performance measurement frameworks may impose uniformity, miss valuable aspects of frontline work, and be generally ill-suited to the exploratory dynamics of nonprofit work (Benjamin, 2012; Hwang & Powell, 2009).

5.3.2. Program evaluation

Program evaluation is "the use of social research methods to systematically investigate the effectiveness of social intervention programs…" (Rossi et al., 2004, p. 25). Program evaluations take a variety of forms and are often data and resource intensive projects; they may

involve primary data collection in addition to using regularly acquired participant data, including performance measures. In contrast to performance measurement, program evaluation typically occurs less consistently and is not beholden to particular forms of information or requirements of publicness. To relax the resource demands, funding for program evaluation has been found to come from the organization that houses the program, the funding source of the program, a separate source, or in some cases, no funding was required, and evaluators often consist of a mix of external experts and members of the organization (Fine et al., 2000; Hoefer, 2000). Program evaluation data collection practices vary widely between and within organizations. Mixed methods evaluations are common, and qualitative data sources may include document reviews, participant interviews, focus groups, or the deployment of a survey instrument, however, few organizations seek data on comparison or "control" groups (Carman & Fredericks, 2008; Fine et al., 2000; Hoefer, 2000; Kim et al., 2019).

5.3.3. Accreditation and strategic planning

Strategic planning and accreditation are distinct processes; however, they share a common episodic need for data to be used by managers. Accreditation is common among nonprofits, including organizations, particularly in education, social services, and healthcare (Cerqueira, 2006). The requirements of accrediting bodies (e.g., Council on Accreditation, Commission on Accreditation of Rehabilitation Facilities) vary widely by field, however, often include staffing or educational requirements, requirements for programming models or practice, and demonstration of outputs and outcomes. In addition to requiring data to become accredited and then every 3–5 years based on accrediting body requirements, M. Y. Lee (2014) found a manager that was incentivized to pursue accreditation to motivate a more rigorous examination of the organization's outcomes. Nonprofits often wish to obtain accreditation to procure new funding opportunities, secure their position in the field, or professionalize the organization (M. Y. Lee, 2014), and becoming accredited may assist organizations in implementing "best practices," improve their organization, and improving their reputation with the public (Cerqueira, 2006).

Strategic planning is common practice among nonprofits to assist in defining their future direction. Planning brings myriad benefits to nonprofits capable of engaging fully in the process (McHatton et al., 2011), however, is limited by the organization's ability to define and measure performance (Crittenden et al., 2003). Organizational data are typically integral to the strategic planning process, as organizations must identify areas in need of managerial attention as well as monitor progress toward the goals established in planning (Craft & Benson, 2006; McHatton et al., 2011).

6. What prevents organizations from engaging more deeply with data?

The preceding sections have articulated that nonprofits commonly capture a range data, including financial, volunteer, public, as well as performance and evaluative information. Yet, nonprofits encounter myriad obstacles to integrating data into their operations, from data capture to interpretation.

6.1. Identifying and capturing meaningful information

Despite a heavy emphasis across sectors, not all nonprofits evaluate programs or use data in decision making (Benjamin & Campbell, 2020). Of those that have attempted to integrate data into decision making, far fewer feel they are using it effectively (Janus, 2018). Nonprofit staff often have trouble differentiating between outputs and outcomes (Lynch-Cerullo & Cooney, 2011), and the difficulties typically run much deeper. Johnson (2015) found organizations often desire to collect information to support their program, however, struggle to assess the reliability of data as well as identify information that can be collected, measured, and/or analyzed to meet their goals. Kim et al. (2019) showed determining meaningful results from performance measures are among the most common difficulties organizations encounter. This finding was echoed in a sample of organizations focused on serving children and families, as staff noted the lack of a formal or systematic procedure by which to identify measures, and many staff believe narratives the superior medium to describe client progress (Carnochan et al., 2014). In cases where data collection has been established in operations, nonprofit staff commonly may have concerns about the quality of data, such as clients providing inaccurate or unreliable information (Benjamin et al., 2018).

6.2. Technical ability and other resources

Nonprofits are a heterogenous group and employ similarly heterogenous frameworks for data collection and storage. Although evaluators and higher resourced organizations are often capable of managing and linking large amounts of information (Fischer et al., 2019), nonprofits reliant on donations are often incentivized to reduce overhead and increase the proportion of expenses on program services, leading them to curb investments in other valuable services related to infrastructure and analysis or equipment such as information technology (Johnson, 2015; Voida, 2011). This is evident in organizational practices. For example, Hackler and Saxton (2007) found less than half of the organizations in their sample were engaged in long-term planning for information technology, budget for technical training, and even fewer measure the impact of such technology. Similarly, Brudney et al. (2016) found nonprofits are often unable to sustain the costs of technology. Even as certain technologies have become more accessible and less expensive, nonprofits have faced challenges in implementing them (Azevedo, 2021).

Lack of technological sophistication is a hallmark of this literature, as many organizations capture data using hand written tools and store them as paper records (Andrews et al., 2016; Voida et al., 2011), or rely on volunteers for technical work such as data management and mapping (Brudney et al., 2016). Newer technologies which may ease access or provide a more holistic view of participants and donors, such as constituent (or customer) relationship management software and electronic case medical records, have begun to appear in the nonprofit sector, particularly health and human service organizations (McNutt et al., 2018). However, when paid employees are available for technical work, they often lack knowledge, exposure, or expertise to perform technical duties (Carman & Fredericks, 2008; McNutt et al., 2018). In one survey, nearly half of organizations reported having an inadequate number of trained staff, and nearly 40% lacked access to affordable technical assistance (Carman & Fredericks, 2010). Due to the lack of technical sophistication and resources among nonprofits, data storage is commonly fragmented, with organizations having many redundancies, and infrastructure that is poorly maintained (Benjamin et al., 2018; Bopp et al., 2017; Voida et al., 2011). Further, many organizations report feeling their existing technology is not capable of collecting the data relevant to their decisions (Herbert, 2014; Kim et al., 2019), or that a single data system is incapable of meeting the diverse needs within the organization (Carnochan et al., 2014). Funding organizations have identified a lack of capacity to manage resources as a main reason to fund the implementation of a measurement system (Benjamin, 2008). The capability of nonprofit organizations to store, manage, and share data may be, in part, a function of the area in which the organization practices, as requirements for administration or compliance differ across policy fields (Benjamin et al., 2018), and nonprofit organizations may be more likely to keep records and measure outcomes, on average, when they are given technical assistance and money directed at information technology (Despard, 2016; Leake et al., 2007; Minzer et al., 2014).

6.3. Prioritizing data work

The capacity of an organization to support data use is often crucial to their engagement in such approaches (Kroll, 2015). Nonprofit organizations often require data work from employees whose job descriptions list primary functions in other areas (Carman, 2007). Also, employees at nonprofits commonly feel working with data, including maintenance of a database or data collection, is less important than work with client circumstances (Herbert, 2014; Voida et al., 2011), or that they are better suited to client interaction (Carman & Fredericks, 2008). While some frontline staff have suggested that data collection assists them in getting to know clients (Benjamin et al., 2018), other employees working with clients may feel data collection interferes with essential processes such as rapport building, and doubt the quality of the data (Herbert, 2014). Frontline and managerial staff may see the role of data in the organizational culture differently (Maxwell et al., 2016), and staff have reported that other data work, such as aggregation, coordination, and sharing, disrupts their daily routines (Benjamin et al., 2018). In general, many organizations report lacking the time necessary to sufficiently carry out data collection and program evaluation duties (Carman & Fredericks, 2010).

6.4. Mission drift and outside influence

The influence of outside actors, particularly under a grant and contract driven business model, can complicate the relationship between an organization and their data practices. In the context of power differentials, organizations may be incentivized to agree to specific outcomes or performance measures that are not the most meaningful to them (Bopp et al., 2017). Data collection for accountability may fundamentally alter an organization's relationship with data, as funders frequently have a different goal or emphasis than the organizations they fund (Campbell & Lambright, 2016; Ebrahim, 2005). This is important, as research on contractual obligations of nonprofit organizations to collect data for other stakeholders, such as government or other funders, suggests that organizations required to collect information for funders may be disincentivized from collecting other (not-required) information, and are highly disorganized in their attempts to satisfy contracts (Bopp et al., 2017; Carnochan et al., 2014).

The acknowledgement of such power dynamics has led to skepticism about early collaboration between nonprofit organizations and government (Brudney et al., 2016). However, these dynamics are at play within organizations as well, and board members can derail data efforts to serve their interests, making it more difficult to collect data with managerial relevance (Bopp et al., 2017). Indeed, the establishment of targets outside the focus of the mission, or data collection with a focus on marketing or revenue generation, are seen as leading to mission drift (Bopp et al., 2017; Maier et al., 2014).

7. Methodological issues

Our synthesis shows that a large portion of research on data practices in nonprofit organizations is descriptive. In general, the questions addressed in this literature relate to the practices and motivations of nonprofit organizations. As a nascent field of study, descriptive research is understandable, and an array of important research questions remain that may be addressed in this fashion. However, as an emerging area, there are several methodological concerns worth discussing. Arguably the most pressing concern is the measurement of the key constructs. Of course, this may presuppose a unifying set of constructs related to the use of data in nonprofit organizations, something that is currently absent. In the current landscape, spanning disciplines and theoretical approaches, there is great diversity in understanding of the key constructs. In some cases, key constructs remain undefined (e.g., Andrews et al., 2016), in others the measurement is incapable of capturing all dimensions. For example, Despard (2016) uses five separate, single item measures to capture evaluation capacity, these include basic "business practices" (such as client feedback). The instrument used in Maxwell et al. (2016) includes measures of "data driven decision making" which is created through the use of multi-item indices, however there is little evaluation of the measures for a first-time deployment of the instrument. Similarly, LeRoux and Wright (2010) include 6 Likert scale items about particular outputs and indicators, which they sum, and call "organizations' extent of reliance on performance measures." These measures are illustrative, and some of these approaches to measurement has been described in the measurement literature as a "questionable measurement practice" (Flake & Fried, 2020).

Researchers have also called for including a broader range of methods and perspectives in data collection, especially in survey efforts. The call to diversify methodologies offers the ability to better address a range of evaluation questions in a more comprehensive or deeper fashion (Ho et al., 2021; Persaud, 2021). With respect to expanding perspectives, there are likely two major advantages to this proposal, the first is the challenge of getting responses from executive directors or other higher-level managers and expanding the response pool may increase the response rate. Others have argued that focusing on executives may paint an incomplete picture of the state of the organization (see Despard, 2016). Maxwell et al. (2016) survey management and funder views of the organization's data practices and found differences between their perceptions of the organization's relationship with data in several areas including the use of data to improve operations and develop programs. The management and staff were more optimistic about the organization's use of data than funders across these categories. However, best practice in this area may fundamentally be a question about the use of data in the organization and the related decision-making processes. There is scant literature on this topic, but many nonprofit organizations do not have staff dedicated to program evaluation and executives or management staff are often charged with conducting program evaluation or other data related work (Carman, 2007). If executives and managers are indeed primarily responsible, then selecting them as respondents may be reasonable, although, if the process is collaborative and involves group based decision making, expanding the pool of respondents within an organization may yield stronger results and require a different class of methods (see, for example, van Mierlo et al., 2009).

8. Conceptual issues

Aggregating the body of research on nonprofit data use is limited by the heterogenous constructs and definitions employed across, and within, academic fields. This literature documents the types of data collected by organizations, the reasons for collection, as well as where organizations struggle, and strategies to improve practice. Despite this, there are conceptual issues restricting our understanding of how data are used in organizations. We have previously described the theories driving research in nonprofit data use across fields, including organizational theories such as neo-institutional, resource dependence, and principal agent theory, as well theories of market failure and the construct of evaluation capacity. Though these theories have generated knowledge to this point, it is often challenging to differentiate between them with respect to "empirical support." For example, many studies focus on the same variables, which create difficulty for scholars seeking to differentiate between resource dependence, isomorphism, and principal-agent problems. For example, using a series of case studies Benjamin et al. (2018) find that contractual requirements to collect data, in addition to the nuances of the policy area in which the organizations work (such as niche specific characteristics), coincide with dysfunction in the organization's data practices. Although they motivate the research through neo-institutional theory, there is no way to differentiate between variation in the norms, legitimizing forces, common resource dependence, or context other specific features. Led by resource dependence Eckerd and Moulton (2011) found perceptions of the environment were

associated with forms of data collection and measurement, which has resource dependence and neo-institutional interpretations. A neo-institutional view of such findings may lead one to suggest that organizations are engaged in mimicry, and the evaluation standards are superficial. However, a resource dependence interpretation is also available, one that may suggest the nonprofit organizations is positioning itself competitively, pre-emptively exchanging autonomy for security.

While authors have acknowledged that principal agent theories are ill-suited to deal with the complex environments in which nonprofit organizations administer programs (Benjamin, 2008; Ebrahim, 2005), scholars have not made the same claims about the macro-organizational theories. Beyond the challenge of finding empirical support for such theories, the macro-organizational theories focus broadly on organizations, marginalizing the role of interorganizational processes. Data work is highly specialized, and interorganizational processes may vary widely between organizations, or between divisions within larger organizations, understanding these processes is vital to progressing our understanding of data use in the nonprofit sector, as well as providing a place for organizations to begin a search for adopting practices. More importantly, there are also problems with the applicability of such theories to organizational practice. While the macro-organizational theories may be "true," their application has been pessimistic about the capability of data, in the form of performance measures or other information to augment processes, rather choosing to focus on data use because of dependence or mimicry.

The construct of evaluation capacity has arguably received more scholarly attention than any other in the area of nonprofit data use (Bryan et al., 2021). However, evaluation capacity has two major limitations; 1) management and decision making exist largely on the periphery and 2) the utility of evaluation capacity is constrained by elements generally omitted, namely, sustainability. Lee and Clerkin (2017) note that measurement in the organizational context may have functional or dysfunctional responses. Dysfunctional responses include measurement for symbolic purposes, such as prestige associated with rigor. This is familiar to evaluators, recall Weiss's (1988) discussion of the "sorry fate of evaluations" when she acknowledged the limits of rationality under political realities: "Program/policy people do not routinely use evaluation 'as the basis of decisions'" (p. 17). These criticisms are also a reiteration of the well-known warnings of new institutional analysts when they have argued "Evaluation and inspection are subverted or rendered so vague as to provide little coordination" (Meyer & Rowan, 1977, p. 343). Such warnings offer indications regarding the use of measurement and evaluation in the context of socialization and political influence over the past several decades, which the contemporary treatment of evaluation capacity has ignored. Evaluation capacity has largely focused on "what is" or "how many" items are measured in a certain context, rather than the managerial relevance of the data capture and information use. As examples, consider the definition offered by Despard (2016) as described above, management and decision making are absent. Further, implications for decision making are the final dimension mentioned by Bourgeois and Cousins (2013), with the greatest amount of importance placed on human resources. As noted, the construct remains undefined in other research, yet the items used in Carman and Fredericks (2010) focus on difficulties in identifying and capturing data, a focus common elsewhere in the literature (e.g., Andrews et al., 2016; Leake et al., 2007). The implications of sustainability of evaluation and data practices are discussed briefly in Naccarella et al. (2007), however, evaluation capacity has yet to receive a formal treatment which addresses all such concerns.

8.1. In need of theory

In general, the theories prominent in this literature are centered around features external to the nonprofit organization, such as funders, norms, and contracts, thereby failing to adequately conceptualize the organization. Though such theories have been and continue to be successfully applied in other areas of nonprofit research, for applications related to data use and decision making, complex internal structures, creative organizational designs, and heterogenous task environments present in contemporary nonprofit organizations cannot be ignored. Employing macro-organizational theories may also underestimate the dynamism of nonprofits in the market (Voida, 2011). This leads to a general theme of disempowerment in the theories invoked in this research, as many of the current theories in application attempt to explain homogeneity in organizational structure, or data use as an undesirable although necessary feature in pursuit of security (see, for example, applications of neo-institutional or resource dependence theories). Further, there are concerns of the applicability of the research motivated by such theories, as the influence of environmental variables may be the least actionable by nonprofit managers seeking to improve organizational processes.

Having discussed the complications encountered with contemporary theories employed in the study of nonprofit data use we now consider what properties are desirable for a theory of data use in nonprofit organizations. The current theories found in this body of literature focus on environmental relations, and while such relationships are important, data may serve different purposes between and within organizations. In this context, applying a theory that does not adequately conceptualize the internal processes of the organization, including their unique needs and mission, or their ability to react to new information, appears insufficient. Rather, a desirable property for a theory of data use would be the conceptualization of intraorganizational processes, including roles, functions, and organizational dynamism. In addition to conceptualizing the organization, we may desire that a theory of data use lead inquiry toward questions that guide management approaches.

Our review has shown that prior research has made clear, *what* data organizations typically have available to them, as well as *why* they may collect such data, however, key questions remain unanswered. Financial determinants of types of evaluation have begun to be studied (Lee, 2020), however, data may be crucial at different times for organizations, raising questions about the right time for varying resource intensity. Further, and are there forms of change (e.g., programmatic, organizational, financial) that benefit most from a type of data. There is generally scarce literature on the design of nonprofit organizations (Aulgur, 2016), however, the broader management literature has shown that design has major implications for the ease of communications and diffusion of information (Daft & Weick, 1984; Tushman & Nadler, 1978). Which raises questions about the connection between organizational design and data use in the nonprofit sector.

9. Discussion

Data have immense potential to improve organizational processes and inform nonprofit management. Data can be used to assist in targeting philanthropic efforts, facilitate collaborations and community impact, obtain a deeper understanding of programs, as well as undertake program adjustments to improve client outcomes. However, the heterogeneity in nonprofit data needs and uses makes it clear that work is required by funding organizations, consultants, educators, and other stakeholders to structure accountability and support in a way that empowers organizations to pursue their mission. This call is not unfamiliar, as scholars have continued to appeal for revision to the application of management strategies from the for-profit sector when applied in nonprofit settings (Beck et al., 2008; Newman & Wallender, 1978). Our synthesis shows mandates by funding organizations as a strong determinant of the types of programmatic information collected by nonprofits, as many nonprofits may collect no other data (Bopp et al., 2017; Carnochan et al., 2014). Therefore, it is crucial that funding organizations verify that the data they require are meaningful to organizations and of managerial relevance. Funders may verify with managers that the information they require can inform program evaluation or be

incorporated into a broader organizational evaluation. This requires foresight and planning; particularly as participant data may often need to be matched with public information or other external data sources to be truly valuable (Fischer et al., 2019).

Incorporating data into managerial and organizational processes is not without difficulties. Managers incorporating data into their workflow must be aware of the possible non-financial costs including: mission drift, staff resistance and morale, as well as challenges of maintaining the infrastructure (Bopp et al., 2017; Harmon et al., 2017; Herbert, 2014; Voida et al., 2011). For these reasons, organizations may benefit from a holistic approach to incorporating data into processes. For example, a movement toward data use may be paired with board and staff education, clarifying the goals of the strategy to mitigate mission drift. Further, revisiting job descriptions may often be helpful, ensuring that staff roles are clearly defined, including responsibilities for data work, and coordination channels for information sharing are formalized. The role of the funder remains prominent, as funders may assess the organizational culture related to data differently than managers (Maxwell et al., 2016), and pressure for outcomes from funders may result in undesirable manipulations (Fischer, 2001). Until these skills have reached critical mass in the nonprofit sector, expectations around the use of information technology in nonprofit organizations must be tempered, and enhancing data capture can be viewed as a capacity building activity (Despard, 2016). Outside of managers and funders, the synthesis makes clear the substantial room for innovation in software, training, and information to assist nonprofits in identifying reliable (particularly public) information (Brudney et al., 2016), as well as data storage and coordination among nonprofits (Andrews et al., 2016; Harmon et al., 2017; Voida et al., 2011). Despite this need, there are immense challenges to buy-in from the sector at large. Particularly, nonprofits are typically averse to spending on technology as an overhead expense more generally for fear of crowding out donations or appearing "inefficient" (Voida, 2011).

Endeavoring to review the literature related to data use in nonprofit organizations has revealed the extent to which the body of research is decentralized, occurring in journals focused on, among others, nonprofit studies, nonprofit management, program evaluation, public administration, and community development. This decentralization, along with the variety of theories, measures, and key constructs, makes a synthesis challenging. Despite this, our synthesis has answered questions related to the types of data used by nonprofit organizations, the reasons they are collected, and the barriers encountered by organizations seeking to engage with data to improve processes. Additionally, it has reviewed several major theoretical frameworks driving research in this area, including organizational theories such as neo-institutional and resource dependence theories, as well as the practice driven construct of evaluation capacity. The review has shown that the field is relatively balkanized and may benefit from engagement with a broader class of theories to supplement the environmental focus of the current literature. Particularly, the current theories often fall short of providing a complete theoretical representation of data use in nonprofit organizations and must situate the role of data in the organization as well as the environment. Areas for future research in nonprofit data use include investigation into issues related to the role of data in managerial processes and nonprofit decision making. For example, although managers typically identify program improvement as a motivation for data collection, it is currently unclear how this is done in nonprofits and how much change is possible in existing programs (particularly, as managed under the auspices of grants or contracts).

10. Lessons learned

This article highlights the many sources and uses of data in nonprofit organizations. In addition to identifying these, there are several key lessons to be learned. The first is that data use in nonprofit organizations, while capable of creating immense value, also carries the possibility of non-financial costs, such as mission drift and staff resistance. The second lesson is the outsized influence of funding organizations in determining the data captured by nonprofits. In this context, it behooves funders to approach data capture from a capacity building perspective. A third lesson is for researchers, as the article highlights the need for the adequate conceptualization of organizational processes, including the way in which management teams use data. The promise of data use by nonprofits remains compelling but to fully exploit the potential value, a more systematic assessment of the avenues for building data capacity and supporting their use is needed.

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