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Story/Telling with Data as Distributed Activity

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ABSTRACT

Based on a workplace ethnography of an organization referred to as the “Metro Data Cooperative,” this article unpacks the multiple approaches to “storytelling with data” held by research subjects. The research suggests that “storytelling” is more than a discursive form that writers break into. Instead, because there are always multiple statistically supportable stories available, researchers and practitioners should understand storytelling as a malleable activity taking place with regard to multiple organizational and technical influences.

KEYWORDS

Workplace studies; visual rhetoric/visualization techniques; ethnography; storytelling

Technical and Professional Communication (TPC) research has lately been enamored with narrative methods and concepts (e.g., Jones, 2017; Kitalong, Moody, Middlebrook, & Ancheta, 2009; McNely, 2017; Small, 2017) to help understand both workplaces and the products workers design. Business communication, particularly in texts directed toward practitioners, has taken the idea of “narrative” further, casting everyone from marketers to executives to non-profit volunteers as “storytellers” (e.g., Forman, 2007; Jones, 2016; Knafllic, 2015; Van Ittersum, 2014). A plurality of “storytelling” scholarship has homed in on the audiences or users of such communication, how they interact with the narrative elements of, to echo examples here, a museum exhibit, an instruction manual, or a speech by a business leader. The result of this emphasis has been viewing “story” itself as a form that can be broken into discrete elements to be taught, analyzed, strengthened, or critiqued. Researchers of storytelling in professional contexts have similarly shaped their own stories about storytelling. For scholars such as Boje (2001), this means constructing methodologies that consider the relationships among “stories” or components of them, considering the social and cultural underpinnings of organizations’ uses of different stories. Others, such as Forman (2007), promote conversationality and improvisation as skills for business communicators and seek elements like exigence (a piece that highlights “your company’s need to act in new ways *now*”) in the story itself (p. 372). Knafllic, writing specifically of “storytelling” forms in data-driven presentations, pushes similar story *parts* – she breaks “story” down into “acts” and speaks of plot development and chronology – while shifting between the language of “storyteller” and “designer.” Bloggers at ColumnFiveMedia (2018) have further suggested that a key to storytelling in visual design is the inference of causality: “In your story world [...] everything must happen for a reason.” Duarte and Sanchez (2016) consider stories “galvanizing moments” that fit a five-part arc: dreaming, leaping, fighting, climbing, and arriving.

Storytelling, then, largely seems to be understood in TPC contexts – specifically consulting-oriented contexts – as a discursive form, a set of *topoi* to be employed to a particular end. This is perhaps ironic, however, given the weight of Henry’s (2000) own narrative methodologies in his foundational *Writing Workplace Cultures* and of Boje, Luthman, and Baack’s (1999) network of stories across organizations. For both, narratives are not simply forms of communication but representations of an organization’s coming-to-being. Narrative-based methods become a way of getting us to understand organizations (or networks of organizations) more broadly. Henry’s (2000) stories of the workplace, collected from

professional writers within organizations, allow individual writers to make sense of their own experiences, and thus their identities as workers within organizations. Boje et al.'s (1999) stories constitute “polyphonic” “fragments” that reveal power relations between organizations rather than within. In both instances, however, these scholars uncover the ways in which “stories” are the result of relations: relations between an individual and their home organization or relations between organizations themselves.

The research reported in this article follows in the tradition of Henry, Boje, and others but with a closer eye on how such relationships affect the ways in which we “tell stories” with data, pushing back against the structural, piecemeal approach to composing data-driven stories championed by those such as Knafllic (2015) and Evergreen (2017). If, as Knafllic suggests, we make stories out of data, then this article sets out to excavate the relationships between writers and organizations that influence the shape and effectiveness of those stories. Ultimately, this article presents an effort to remove “storytelling” out of what Small (2017) calls “the shadowy skepticism of the campfire anecdote” (p. 250) by placing the concept squarely in the hands of the practitioners who negotiate it. I suggest that, instead of taking “stories” as multi-part discursive forms that simply contextualize quantitative data, scholars should understand “storytelling” as a process of coordinating persuasive or actionable goals with the limits of what data can say within the bounds of a writer’s given circumstances. Instead of approaching such stories for their “beginnings” or “exigence” or “calls-to-action,” we should seek out what *changes* are brought to the numbers as the form they are presented in changes. That is to say, as we approach “stories” built around data in business, technical, or policy contexts, we need to recognize that there are multiple statistically supportable stories shaped by a range of forces and activity. The chosen story is a result of situated realities for the writers and the very human choices they made in response to those realities.

In what follows, I first consider the rich research that addresses the ways in which humans create and encounter “data” and how data is understood in professional and technical contexts. I then turn to a long-term ethnographic study of a workplace organization I refer to as the Metro Data Cooperative (MDC). Through observation and interview notes, I unpack the multiple perspectives on “storytelling with data” held by MDC employees and how the scenes of MDC writing can be read into the final, public-facing “story” the organization produces. Finally, I consider the implications of this ethnographic study for the field of technical and professional communication (TPC), and the ways in which scholars and practitioners can benefit from a richer view of “storytelling” as situated activity.

literature review: visual and networked forms

A sample of texts across digital humanities and TPC speak to the multiple ways data acts and is acted upon in relation to its rhetorical, communicative, and technical contexts. Drucker (2014), Halpern (2014), Gitelman (2013), and Manovich (1999, 2002), for instance, all understand that data is never raw but rather is the result of specific social and material circumstances, technical means, and human choices. For Halpern (2014) and Drucker (2014), interested in the idea of encountering data visualizations or presentations, data only exists in relationship to its technology and observer, a “cybernetic” relationship (Halpern, 2014, p. 78) found in “spaces where representation, practice, technology accumulate – to show things in the world” (p. 37). Those who contextualize and represent data in visual ways must “visualize interpretation” (Drucker, 2014, pp. 57–59), while viewers make connections based on spatial cues, “interpreting [the] visualization” (pp. 135–137). Considering the above scholarship from media and critical theorists, then, a broad but salient theme here is that data – particularly quantitative data – matters only within a context. Most often, that context is cultural, found either in the encounters with data or applied to the data by something like a narrative form.

Technical and professional communication scholarship speaks to this need for context in understanding stories and data as well. Wolfe (2010) points specifically to quantitative data as being contextualized through the management of *pathos*, or the emotional appeal, framing data in such a way as to evoke a human reaction from an audience. Forman (2007) characterized successful “storytellers” within organizations with an ability to create “representative anecdotes” out of a given situation and to place the organization as a whole in what she calls a “strategic story for their organization,” “a vision of [...] future

direction[s] and why or how they think [those goals] are achievable” (pp. 370–371). Relatedly, Knafllic (2015) explicitly ties “storytelling” to a “call-to-action,” or a potentially measurable goal in the context of the quantitative data a storyteller tries to present. McNely (2017) points to the persuasive power of story, particularly as it arrives “just-in-time,” in “micromoments” that can sway a consumer of the story to act in a specific way (p. 445). Van Ittersum (2014), similarly, understands “story” as situated. Van Ittersum (2014) argues that the goal of story in communicating technical material (of which quantitative data is surely an example) is to “emplace” the reader in the story, creating “an engaging and accurate story that readers will be eager and able to play out in real life” (p. 235). Jones (2016), working with the Innocence Project, casts “story” as the thing that professional (often legal) workers base their actions on, actions that span the arenas of “policy, litigation, and organizational operation” (p. 304). Across media theory and TPC, then, “story” has become a key addition to what these collective fields understand as persuasive yet fraught. Story, in relation to the way organizations cast themselves, can both build an organization’s *ethos* and craft internal calls-to-action. In relation to external audiences of technical material, story forms can call on receivers of the communication to identify *with* the material – via characteristics like Wolfe’s appeals to *pathos* or something like Burke’s (1962) concept of identification – prompting specific actions by encouraging receivers to enact the story through to its conclusion.

Yet these crafted “stories” remain fraught because, regardless of application, they are limited. They bear the marks of limited data sets, digital interfaces, and, as Boje et al. (1999) describe it, “micro level hegemonic moves” (p. 341) that filter through dominant social and cultural concerns. Diehl, Grabill, Hart-Davidson, and Iyer (2008) perhaps get to the heart of the matter. The authors overview a resource-mapping project and the development of a mapping tool, “Grassroots,” based largely on Google Maps. The “Grassroots” tool supports asset mapping for community development and engagement. The resulting maps, as the authors demonstrate, are limited and prone to deficit-oriented “stories.” That is, these maps entice viewers to discuss where resources and assets *are not* (p. 422). The article hinges on this tendency, this limitation, and demonstrates how “storytelling” can “reveal how certain assets may lie hidden or dormant or may not take on a purely material presence” (p. 428). Such stories, for Diehl et al., come from the community and these neighborhoods. Such stories function to illuminate hidden assets, or things that may not have otherwise been recognized as assets, to reveal more about the work done in these communities. In turn, richer, fuller stories theoretically prompt richer, fuller appeals, calls-to-action, and responses to the stories themselves. How these stories are shaped around or with the data-at-hand, then, should grow out of this imperative to illuminate what is hidden: both in terms of what the “story” tells us and how it came to be told in that way.

Background: the MDC organizational ethos

This article is based on a multi-year workplace study of an organization I’ll refer to as the Metro Data Cooperative (MDC). MDC is a non-profit organization under the umbrella of the City-Community Partnership (CCP). MDC borrows the CCP’s 501(c)3 status and is overseen by a policy board made up of key CCP funders (i.e., members of prominent foundations and corporations in the city of Gateway). This partnership creates an odd symbiotic relationship. The CCP is a philanthropic organization partially funded by the organizations represented on the MDC policy board, and the MDC becomes something of a mouthpiece for how donors should direct their funds. In other words, donors indirectly influence MDC writing, which in turn influences where future donations will be directed.

The MDC’s mission is to design and produce data-driven reports for uptake in non-profit, private, and civic organizations throughout Gateway. Their mission statement emphasizes a co-working mentality, referring to a “shared agenda” among organizations that the MDC helps promote. Following this mission, MDC publishes annual “Rising Metro Reports,” tracking progress against key “community indicators.” In other words, the MDC acts as a central resource for community- and city-centric, data-driven research. They study trends across four broad areas, which they refer to as “Drivers of Change”: Health, Education, Jobs, and Quality of Place. Where possible (given available data), MDC tracks these same trends in their 16 “peer cities,” places like Cincinnati, Charlotte, Nashville, Birmingham, and Indianapolis.

An organization's agenda – its shared goals and plans for achieving those goals – provides, in many ways, the clearest view of an organization's *ethos*. Though *ethos* has popularly been understood as the air of credible character that attends the persuasiveness of a communicative act (Aristotle, 2001, p. 1329), Henry's (2000) work has contextualized *ethos* within a broader communicative context for workplace situations and activity. For Henry, an organization's communicative output is contextualized in an ecological and transactional model and is both “polyphonic [and] contentious” (p. 148). That is, an organization's “character” is a result of transactions of meaning – or expressions of an agenda – among “real authors” (the individuals who write reports) and “imagined authors” (the concept of organizational identity that those individuals adopt), “imagined writers” (the types of individuals whom readers imagine to create reports) and “imagined audiences” (the types of individuals whom writers imagine to take up and respond to reports), “real authors” and “real readers” (the actual readers who take up and physically respond to reports), and so on. At times, MDC circulates report drafts to those they wish to work with: university researchers (e.g., public health academics), non-profit workers (e.g., Urban League executives), public employees (e.g., citywide task force members), and private sector employees (e.g., health insurance executives). The feedback the team gets in return comes in the form of individual responses from real audiences. These responses, considered collectively and discussed in meetings, constitute a “real audience” and signal possible uptake of a broader “imagined audience.” Henry's model, then, suits the idea of a “shared agenda” as the MDC understands it through their mission statement. Their sense of an “agenda” as “shared” is a result of both real and imagined audiences that work toward similar civic goals, and the activity of circulating reports through pre-determined feedback loops to construct their organizational voice. The data they use and the “stories” they tell are fundamentally tied up in and shaped by this *ethos*-building activity – an activity that, in turn, shapes their writing output in profound ways.

Methods and methodology

Broadly speaking, this research grows out of a mixed-methods, ethnographic approach to my research site and subjects. Entering as an outsider with no prior relationship to MDC, I embedded myself in the organization for multiple years to study its research, writing, and production practices. Though I often noted external activities that were quite interesting (e.g., conversations regarding political developments in the city, choices of meeting spaces beyond MDC's home office), their work practices took up the bulk of my observation notes. The purpose of my research was not to identify “best practices” for “storytelling with data.” Instead, this study was designed to understand how real-world organizations conceive of and deploy “storytelling” for specific ends. To do so, I conducted audio-recorded, open-ended interviews to complement ongoing participant-observer methods and activity-network mapping. In what follows, I detail and justify the use of these methods and methodologies.

I approached my observations via a rhetorical understanding of experience architecture studies (see Sullivan, 2017). Experience architecture methods center the experiences and activities of humans working with tools unimpeded by researchers or artificial research sites. Rather than invite users into usability laboratories, that is, experience architecture methodology prompts researchers to observe human users of artifacts in their “natural habitats.” Sullivan's (2017) methodology for such studies thus privileges the “encounter,” ceding control to subjects and embracing observation and unstructured interviews. For this research, such an observer position allowed themes of storytelling, bureaucracy, and hypothetical use cases to arise organically and structure the research over time. In other words, I emphasize “storytelling” in this research because the research subjects described themselves to me as “storytellers.”

Functioning as an observer called for open-ended and impromptu interview methods. Rather than enter with a set of defined questions, I prompted interview subjects to simply discuss how they thought projects were progressing.¹ By no means would I suggest here that my presence was entirely neutral. Indeed, as Kirsch (2005) has suggested, despite the trust-building done in advance of interviewing, interview methods necessarily reflect the power dynamics of the interview scene: “... interviews are likely to be asymmetrical interactions, with one party – the party generally with the most institutional power – asking the questions and the other answering” (p. 2165). And while I spent great effort and

time building trust prior to interviews, I concede Kirsch’s point that power dynamics are evoked and likely felt through my presence in these spaces.

I began observing MDC in June 2015, largely focusing observation notes on discussion of process: mentions of where report drafts moved, which databases were used, how data visuals were produced, which partner organizations had weighed in on conversations, and the struggles associated with each. After a year of solely observing the group, I scheduled one-on-one interviews with five team members to get their retelling of their experiences of the drafting process. The five participants in question were Andy (project director), Amy (project manager), Loretta (vice president of MDC’s parent organization and part-time MDC employee), Nick (data scientist), and Tom (data scientist). Interviews began in September 2016 and ended in March 2018. I interviewed the five team members a total of 15 times. I spaced the interview rounds out widely in order to avoid repetition of questions or interviewee language. This made for a richer set of transcripts for coding, despite hitting on the same themes. Throughout observations and a majority of the interviews, rich discussions of “storytelling” became a common refrain.

I transcribed interviews and provided transcripts to the interview subjects to correct spellings or clarify points they felt could be made clearer. With the exception of Loretta, interviewees rarely amended transcripts. I then employed inductive, grounded theory to code data. Having observed the organization for a full year before starting interviews, I had seen the ways in which conversations of “storytelling” could dominate meeting discussions (e.g., “Is this a convincing *story* though?” [obs. notes, July 2016]). I hypothesized that storytelling would be a naturally occurring theme of the interviews. This hypothesis was proven true. Andy led the way in frequency, invoking “story” 29 times in 85 minutes of recorded interview. Running a simple word search for “stor*” and “narrat*” across transcripts, we see the data in full in Table 1.

In the iterative spirit of grounded theory, I returned to the data to group these instances conceptually. That is, I considered instances where “story” is spoken of rather than iterations of the word itself. In this way, I began to see a rich range of key themes emerge. In particular, I considered the ideas with which discussions of story collocated. Initial findings follow:

- 36 invocations of “story” as a way of understanding or working with ‘data’²
- 13 instances of story providing statistical context
- 12 instances of story “humanizing” the data
- 12 instances of tying story to a “call-to-action” with data
- 5 instances of story referred to as interpretive by audiences
- 5 instances of story referred to in terms of memorability of data/context

While these initial findings provide only a surface-level snapshot of how “storytelling with data” is approached by individual members of the organization, some interesting, heavily rhetorical findings are apparent: a “humanizing” drive, a sense of “call-to-action,” and a relationship between rhetor and audience all shine through. Moreover, within this data are slight hints at external considerations – the databases themselves, partner organizations, the “policy board” – that all effect some change during the drafting process of MDC reports. Andy, for example, hints at multiple points of influence on the story form when he explains,

Table 1. Preliminary coding data on MDC invocations of “story”.

	Total Direct Invocations of “Story”	Total Recorded Audio (rounded to the minute)
Andy	29	85
Amy	10	101
Loretta	4	99
Nick	23	164
Tom	38	210

Brookings comes out – we know that we want to tell a story about poverty. We know that that is an issue. It's timely nationally. It's something that there's a lot going on in our community where if the data supported it, [MDC] could help galvanize some conversations that would really bring people together because there's a lot of disparate activity ...

Here, Andy notes the importance of a prior document (“Brookings”), a perceived national discourse (“It’s timely nationally”), and the *kairotic* moment both seem to provide. Later in the interview, he points to the policy board itself: “... this year is really ‘Okay, let’s talk about poverty and the impact of poverty,’ um, so the board at those points needs to be engaged, and I think this is where we’re going. Does that sound right?” In each of these cases, Andy considers the ways in which other elements, some more abstract and some more concrete, hold sway on the direction of MDC storytelling activity. Whether it is a case of prior publications or broader discourse acting as the exigence for a story theme or the policy board itself holding the power to veto part or all of a “story,” Andy and his MDC colleagues are keenly aware of these necessary considerations, even as they often evoke “storytelling” as a rhetorical posture they can simply adopt for greater effect.

Subsequent sections will outline other considerations team members must make throughout their storytelling activity. I will parse out the ways in which these considerations can be read into discrete pieces of MDC reporting and “stories.” That is, I move through one particular report and a string of related interview transcripts to demonstrate the richness of this “storytelling” activity as the active triangulating of multiple rhetorical goals and organizational demands on their work.

Analysis

MDC team members’ conceptions of storytelling sit partially within Knaflc’s (2015) conceptual framework, which positions story as the driver of decision making. But Knaflc also suggests that stories are inherent to data itself: “... your tools don’t know what the story is. That’s where it takes you – the analyst or communicator of the information – to bring that story visually and contextually to life” (p. 3). This is where we see a large divergence from Knaflc’s approach on the part of MDC, particularly given the range of in-house interpretations of what storytelling does and how it does it. For MDC, data does not inherently *humanize*, for example, and there is nothing inherently humanizing within numbers that can simply be pulled out and communicated. Rather, specific activities undertaken by individual MDC writers recast collected data in ways that make it feel human.

Team members emphasize different components or outcomes of “storytelling,” pointing to a range of motivations for the activities they undertake while researching, drafting, visualizing, and circulating these stories. For Andy, MDC’s director, story is about providing a means for users or receivers of the report to identify with it:

[We use story] to get them to be engaged in our traditionally disinvested communities. We have an agenda; we have data to support why that’s our agenda, and, you know, part of what we struggle with is how to we tell that story so that people will absorb that data and bring it into their lives and act on it.

For Amy, MDC’s project manager, story is about humanizing the data in a way that makes it more immediately actionable by allowing audiences to identify with it on a more personal level:

There’s definitely a need for us to stay rooted in both sides of the table [...] with data being the charge for making the case for anything that we say and, you know, humans being the reason.

And for Nick and Tom, two data scientists affiliated with the group early in my observations, story is about identifying what statistical significance, or even what *policy* significance, arises from the way the data shakes out. For Nick,

When you have a story, it’s when you make a choice among [the different interpretations of correlation and causation]. So in the case of – so say I have poverty, I have race, I say “Hey, these are correlated.”

And Tom:

Statistics is something that without context doesn't have any good meaning, and that's something that's very consistently reflected in what I'm looking for. So what's the question, and how does the question fit in the construct or structure of what you're trying to create or answer or whatever the case may be?

We may expect such diverse understandings of storytelling – what it does, how it arises, and its impact – to present places of conflict. Yet what we see more importantly in this range of perspectives is a glimpse of how vast the idea of storytelling is: its purposes, potential uses, relationship to data, and the activities underlying it. Story, for MDC, simultaneously humanizes and calls us to act, it contextualizes data and helps non-numbers-people make more sense of it, and it results from choices such as deciding to highlight correlations. That is, storytelling activities act on and transform the way report audiences interact with the numbers underlying MDC reports and the claims they contain.

However, even these individual conceptions of what story can *do* are fraught. Statistical context, for example, warrants further unpacking, particularly for how it is employed by MDC writers and how it may be taken up by different audiences. Nick, in an interview, demonstrates how this statistically driven idea of storytelling is both a writerly goal and a check against potentially irresponsible data use:

... obviously correlation is not causation. This is sort of true but incomplete. When you see a correlation, assuming you weren't just like data mining and it happened – because if you run twenty sets of variables on twenty other sets you'll get some correlation. So assuming for a moment that it's not statistical noise, it means one of three things, or some combination of them: x caused y, y caused x, or z caused x and y.

Here Nick reviews a few of the statistical-rhetorical moves that a storytelling imperative provides MDC writers. By distinguishing correlation from causation and running through a list of what the correlation *could* mean (“x caused y, y caused x, or z caused x and y”), MDC writers are given a jumping-off point for crafting story around or on top of the underlying data points. Such writerly moves pull from a range of statistical tools and provide the groundwork for a negotiated “story” to form out of the data points.

Data storytellers like Nick – to pull an example from the report under study here – negotiate multiple statistical implications in discussing things like wealth and educational attainment (a measure they often consider through proxies like those in [Figure 1](#): “kindergarten-readiness” and “college- and career-readiness”). Considering the data visually, a clear correlation emerges and MDC workers are left, according to Nick, to choose among these interpretations:

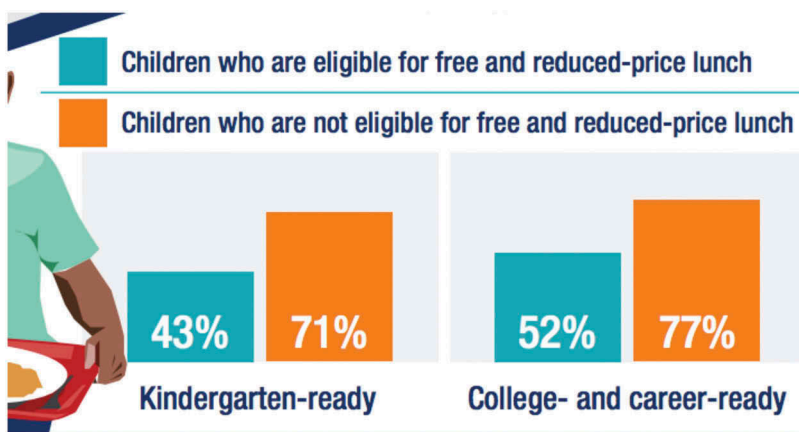


Figure 1. Screenshot of MDC report. Comparative bar graphs representing correlations between economic status and educational attainment.

- Living in low-income households causes lower “readiness” among youth.
- Lower kindergarten- or college- and career-readiness among youths causes them to live in low-income households.
- A third variable depresses household incomes, kindergarten-readiness, and college- and career-readiness.

The second of these propositions, under even the most minor scrutiny, proves absurd. To suggest that poor kindergarten or college- and career-readiness makes one eligible for free- or reduced-price lunch (the metrics used as a proxy for broader economic conditions) is a faulty proposition at best. A child’s educational level does not create or reduce household poverty. The first and third possibilities, however, seem plausible enough to build a narrative around, to build a framework that justifies what, at its root, is a fallacy that Nick-as-storyteller must operate from: that correlation points to some causation. However, operating from this fallacy does not necessarily mean MDC is perpetuating falsehoods. Pulling from the first of Nick’s options, that poverty causes lower educational attainment among Gateway’s youth, we can extrapolate and illustrate how lower economic status limits educational opportunities for children; in Nick’s third option, we can point to systemic oppression and suggest, perhaps, that racialized policies are a statistically significant predictor for both low economic status and low educational preparation. Relatedly, MDC could (as they have approached doing so, but never published in this exact form) represent these three metrics simultaneously in a “heat map,” pointing to areas where high minority concentration, low economic status, and low kindergarten-, college-, and career-readiness all occur.

There are, of course, other convincing stories we can craft around the correlation we gather from the graphs above. But, as Tom – another MDC data scientist – explains concisely, it is impossible to do that with 100% statistical precision. Tom couches his approach to storytelling with data in terms of the team’s goal:

So the goal is to address a problem of poverty and racism; things like that. And I think there is no data set that does that best. The goal – it’s kind of an asymptotic line: you’re trying to get closer and closer and closer to the point. And I think that they’re heading in that direction, and I – I like to tell stories with my data boards. I don’t necessarily see a firm storyboard here, but that’s less them and more so them having to meet standards and goals and guidelines of people outside of them.

In other words, without seeing the statistical overlap, we can reasonably hypothesize that variables like health insurance, joblessness, access to healthy foods, past trauma, and so on all may have some effect on the bar graphs and thus the apparent correlation across variables. However, “there is no data set that does that best.” No data set can make mathematically clear the causal relationship between, say, a legacy of racism and community-wide educational attainment. These variables are difficult enough to define in the first place. Yet, for Tom and the MDC writ large, their ultimate goal – to build and sustain working relationships that move Gateway forward across their metrics while meeting the “standards and goals and guidelines of people outside” that influence the organization and its practices – is what shapes the stories they craft.

Nick echoes Tom’s concerns with the natural incompleteness of data sets and the limitations of their data to tell a truly precise story. For Nick, however, it is simply a matter of how far they can reasonably go. Referring to the previous figure and the three causal stories Nick presents, he elaborates on the unsteadiness of what MDC is doing with its numbers:

And we would need a more in-depth analysis to try to differentiate those stories. And I think – I mean one of the difficult things is that data is almost always going to be consistent with multiple stories. So while we can rule out some, we can’t settle on one thing, much as it’s difficult to find a single truth about things. But what we can rule out are a lot of false possibilities. And I actually have compared it to literary criticism before, like there’s no one single true interpretation of Macbeth.

The Macbeth comparison notwithstanding, Nick brings us to a valid concern: Any data set can speak to, or bolster, multiple possible stories. Many of these stories hinge on previously held positions, perhaps, or what Boje (2001) would refer to as the elements of “antenarrative”: the fragments of other stories (here, stories of links between class and educational attainment or among race, economic status, and kindergarten

readiness) that help shape the “story” we see before us. And it is the job of MDC data scientists, writers, and other team members to negotiate both these antenarrative fragments and the present demands of their scenes of work. Storytelling arises from that negotiation, and stories result from the choices they make in those moments.

MDC stories can ultimately be seen as resulting from the same activity that builds their organizational *ethos*, activity that happens on a given network that includes their data sets, partner organizations, oversight policy board, and so on. And, specifically, the stories they craft have to meet the organization’s sense of itself in relation to its multiple audiences and its position among a broader network of actors and organizations. It has to, as Andy describes it in one interview, chart “linguistic paths” for partner organizations to follow, meet the demands of MDC’s executive board and parent non-profit, and meet the needs of real audiences (those who see and respond to early drafts of specific reports) as well as imagined ones (those abstract actors who may take up the report and act with it for positive community change). While those like MDC’s executive board may want a “hook” (or, as they call it, a “two-by-four”), other audiences and network actors make other demands. Such network actors can be mapped and analyzed to gain a greater sense of where data and report drafts move during the process of crafting an MDC story. Table 2 outlines these different locations and considerations for MDC writing, as well as the demands made on the “story” form by each.

The table here represents the four major arenas of influence on the MDC writing process: influences brought on by the MDC team in meeting rooms by the executive board that oversees their activity, by external organizations invited to review MDC drafts, and by the digital databases themselves. Moving left-to-right, we see the results of activity taken up to address each point of influence. As MDC considers the goal of future action – asking how (or if) a report can be taken up and used later – they account for these multiple areas of influence by telling a story about the dispersed and intertwining nature of “multidimensional poverty.” As the executive board asks for a primary data point to hang the report on, the MDC team responds by centralizing a data point that they can defend with the numbers on hand: “1 in 7 residents [live] in a multidimensionally poor census tract.” Note, here, that the data is granular enough only to make claims about geography, about where people live, not the economics of individual people. Further, as external organizations demand recognizable frameworks and figures, the MDC team responds by adopting a Brookings

Table 2. Overview of arenas of influence on MDC “storytelling” activity, including representative questions asked and examples for each.

Arena of Influence	Demands of Story	Example	Level of Influence
The MDC Meeting Room	<i>Does it feel like it can be taken up and used productively by imagined end-users?</i>	“The negative effects of poverty are broad. Poverty impacts community health, education, and jobs throughout our city. The factors influencing poverty do not exist in isolation and cannot be addressed in isolation.” (from MDC 2015 Report)	<i>Organizational</i>
The CCP Executive Board	<i>What is the central, driving data point? Does it meet the standards set in previous reports? Will this data point motivate readers? Is it accessible?</i>	“Gateway ranks 15th out of 17 among our peer cities, with 1 in 7 residents living in a multidimensionally poor census tract.” (from MDC 2015 report.)	<i>Organizational</i>
External Organizations	<i>Does it use the same terminology as our organization? Does it use metrics we will recognize?</i>	“I mean, like, we chose to use that framework. One of the reasons we wanted to use it is because the Brookings name carries weight in city government.” (from subject interview)	<i>Use-case</i>
The Digital Database	<i>Does the available data support the story? Can supporting data be accessed, or built, based on what is available to the team?</i>	“A lot of these data points are available for Tulsa, but I was able to reconstruct Tulsa using PUMAs. PUMAs need to match 90% with an MSA to be used. That’s Minnesota standards. And they match here.” (from researcher observation notes)	<i>Technical</i>

framework, defending that framework by saying it “carries weight in city government.” Notable here is how easily this motive accounts for greater potential actionability, too. And finally, when the databases fall short of meeting demands, data scientists like Nick pull a new database into their activity networks, “reconstruct[ing] Tulsa out of PUMAs.”³ The examples presented here show the ways in which story forms are honed based on the needs and demands of different pieces of the network MDC writers find themselves working within. If a database cannot provide comparative graduation rates across cities, MDC has to either scrap stories that would compare graduation rates, turn to a new metric like “percentage of residents with bachelor’s degrees,” or reconstruct the missing cities, as they did with Tulsa, within their model. Thus, this lack of comparability limits what they can say about cities, what stories they can tell. It limits possible stories further when accounting for the need for framework recognition – here the drive to adhere to Brookings – which prompts MDC to pull in some variables in favor of others.

In short, such stories must both appeal to the different points in a network and respond to the influences on their position in the same. Stories must appeal to the board and to individual team members, and they must appeal to external “stakeholders,” as Spinuzzi (2015) described them, who inform MDC writing projects (or projects that call on MDC reporting) while maintaining “values, viewpoints, and ethical standards” from their home “fields, trades, and disciplines” (pp. 103–104). An MDC data-story must do all the things that good “storytelling with data” does – humanize the numbers, craft a call-to-action, create a place where audiences can identify their own role in the story – while contending with the limitations placed on them by their available technical and statistical tools, the available data, and the demands of partner organizations, executive boards, and beyond.

Implications and possible directions

The static, competency-based, and definitional approaches to storytelling with data brought to us by those like Knaflc (2015) and Evergreen (2017) are no doubt valuable. Afterall, teachers (in corporate or collegiate capacities) should find it worthwhile to broach questions of motivation, calls-to-action, and context as we approach topics of the rhetorical deployment of numbers with students and colleagues. However, these approaches also run the risk of shortsightedness, especially if we adopt them without considering the rich mobility of those who craft stories with data and visualize them for specific purposes. Following the lead of MDC and other storytellers, we should recognize the ways in which data-driven writers undertake a range of activities to coordinate a range of goals. Moreover, these activities – the technical processes of gathering and visualizing data, the rhetorical activities of contextualizing and deploying that data for persuasive purposes – necessarily change the way a story can be told with data. In brief, MDC demonstrates how these considerations are situated according to their particular context. Other non-profits, other organizations, work from their own.

Storytelling is a fraught activity, as implied by salient themes of “storytelling as hurdle” and stories as “interpreted by end users” in the interview transcripts. Moreover, observations aided by transcripts produced a rich activity map (see Figure 2) illustrating the sheer complexity of this active storytelling process.

Within this map we see stakeholders, executive boards, partner organizations, databases, digital interfaces, and more. The map is incomplete, to be sure, but demonstrates the movement undertaken by both writers and their produced objects prior to print. Ultimately, report drafts can be traced to four discrete scenes prior to finalization: a technical scene of databases and computer programs, a bureaucratic scene of the executive board and review meetings, the public scene of external audiences and proposed report users, and the internal scene of MDC workshopping. The individual writer will have tasks imposed upon them (e.g., tracing a single data point over the previous decade), and then work locally, pulling from their own technical scenes of writing (e.g., the databases and computer programs they use).

In these brief, local moments, we see multiple points of influence start to converge: the executive board, the limits of a given database, and the properties of the digital system the writer works with.

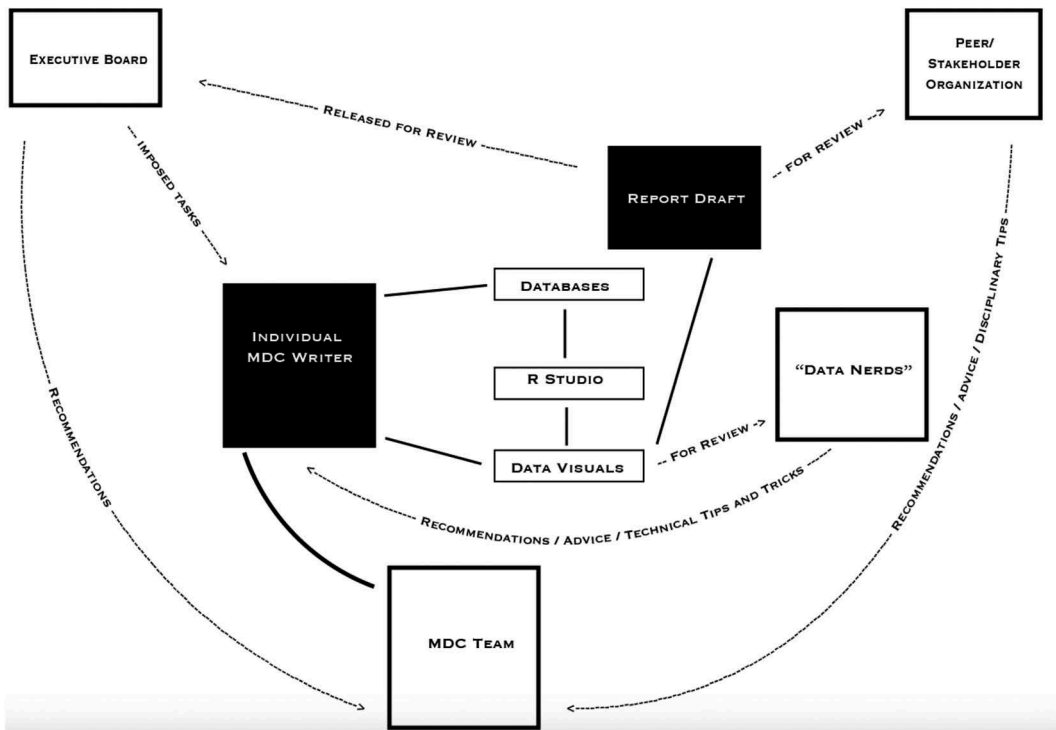


Figure 2. Partial activity network map of MDC writing. Writers and objects are represented in black boxes with white text, while points of influence are represented in white boxes with black text.

The produced data visual is then shopped to peers in the data visualization and public policy communities (affectionately referred to by MDC as the “data nerds”), who provide recommendations directly to the writer. The writer returns to the technical scene, applies the recommendations, and lengthens a series of data visuals into a preliminary draft to be shopped around to other organizations – both external organizations and MDC’s own executive board. The process then repeats. Meanwhile, technical/statistical and organizational demands round out how the story can be exactly told. The demands that shape the story or piece of a larger story (see Figure 1) are myriad: e.g., statistical considerations of measuring things like access to free or reduced lunch; using “readiness” as a proxy for attainment; the technical considerations of comparing multiple variables via mixed color-scheming; the policy board request to include educational data in the first place. Other pieces, other MDC stories, consider similar influences as well. This situated, networked process provides evidence that, as expounded upon by those like Halpern (2014), Drucker (2014), and Gitelman (2013), data doesn’t exist independently of its packaged form. Moreover, the act of packaging doesn’t happen in a vacuum.

The research presented here thus leads us to three broad implications. First, this research suggests that we should understand storytelling as more than a set of skills that can be approached in a vacuum and instead treat storytelling, particularly storytelling with data, as an activity best approached through awareness and reflection on rich organizational and situational dynamics. Second, as we approach stories built around data in business, technical, or policy contexts, we need to recognize that there are multiple statistically supportable stories. The chosen story is a result of situated realities for the writers and very human choices. And, finally, organizational authors who write these stories should – and often do – own the statistical malleability and incompleteness of those stories, recognize the multiple audiences that may encounter them, and respond in a way that is statistically true, actionable, and humanizing. As we see from Nick’s and Tom’s transcripts, data is understood as necessarily incomplete, and these writers

understand that the choices they make in presenting data control how it is understood and responded to. Though it is tempting to suggest that organizations don't fully understand that tenuousness of their communicative production (particularly their inability to control its uptake), MDC – perhaps especially Nick and Tom – seem to, even if they don't outwardly attend to the unexpected ways their data may be taken up and used elsewhere.

Understanding storytelling first and foremost as an activity that stems from an organization's understood position within a larger real or imagined confluence of communicative networks points us to the very real motivations for doing the work of storytelling in the first place. For MDC, as shown by this research, the end-goal is clear: the story should make the data actionable. Citing Bødker, Spinuzzi (2003) makes explicit the connections between activity and transformation and transformation and further, future action: the artifacts created via transformation within a system are transformed in order to – in this new, transformed state – mediate future work (p. 40). In other words, the story-transformed data produced by MDC is produced to later mediate work with that same data.

En route to actionability, however, are questions of accessibility, recognizability, and statistical accuracy. We see these same micro-level motivations in the organization's activity and in individuals' considerations of how and why they employ storytelling at all. The MDC authors who write these stories, then, should own the contradictions and tensions among these motives, the strain on statistical fealty brought on by the greater desire to make data relatable or actionable via story. MDC writers are doing what Wolfe (2010) suggests all students of writing do: "dismantling neat and counter-productive distinctions between the verbal and numerical" (p. 470). And further, they are, as Wolfe (2015) suggested, engaging in creative and inventive acts to foreground specific interpretations. They do so via acts of transformation from data to story and from story, ideally, to action.

MDC writers echo what digital humanities scholars and theorists of visual and digital media have suggested for some time: data is never raw. Data is sliced in databases and eliminated when considered an "outlier" or "false." It is presented with an embedded interpretive level whether it is found in a single U.S. Census table or read into a complex, interactive heat map. But as the present study suggests, that malleability is only present because of the rich, dispersed, and negotiated activities that underlie the presentation of data in every instance. MDC presents, perhaps, a more obvious version of this work, explicit in foregrounding "story" as a form that is built with and around data. Such activity, as has been shown, calls on MDC team members to navigate numerous considerations, whether brought on by the realities of their home organization or by the limitations of a specific site of data gathering. The story results from this activity of telling, regardless of how we classify the tropes that "tellers" find most successful.

Future research, then, could seek out less obviously "composed" data presentations. The presentation of the aforementioned Census data table, one could safely assume, is likely as influenced and informed by the activity networks U.S. Census employees find themselves within: networks of employees who collect the data, politicians and bureaucrats who choose what is collected, individuals who are more or less inclined to be truthful, and political climates that may influence all of the above. Storytelling may not necessarily always be as involved a process as MDC activity suggests; their own version of that activity is a result of their own circumstances. But I would propose that the storytelling activity is present in some form in nearly all presentations of quantitative data and always informed by the motives and circumstances that underlie that activity. Forman (2007) perhaps comes closest to questioning these motives and circumstances from a practitioner and pedagogical perspective, as she broaches questions of the audience's motivation to *continue* listening to a story (i.e., *what's in it for them?*): "For instance, are there pressures to form alliances, heightened competition, or volatile markets?" (p. 372). Questions such as these recast storytelling as a rhetorical question, one that hinges on the storyteller's context in the act of disseminating that particular story.

To that end, another possibility for future research would be to flesh out a vocabulary, a grammar, or a schematic for storytelling *as* an activity. If we are to expand on the baseline here – a study that enumerates one organization's motives and circumstances – what can we generalize from it? Must story always humanize or contextualize or make data accessible? Must it necessarily – as Knaflic (2015) and Evergreen (2017) would suggest – imply or proclaim a call-to-action? Can we imagine a storytelling

activity that acts beyond or without these motives, and what would the story *form* that writers bring to data look like? What tools and considerations must we have on hand (be they technical, statistical, bureaucratic, or cultural) to encapsulate storytelling activity as something understandable and distinct?

Bringing activity theory and organizational *ethos* to this rising concept of “storytelling with data” will further uncover the ways in which story itself is formed, enriching our understanding of story not just as a form we can apply to our data but as a motivated activity of transformation for specific ends. The MDC communicative and composing activity speaks to recent developments in activity theory and, in doing so, opens further doors to us as researchers of TPC and related fields, calling us to question the ends to which a singular story form needs to be addressed or accepted at all. Ultimately, this research suggests that the very things scholars have pointed to by way of describing story as a form in the first place – the discrete discursive forms and tropes – are entry points for us to dig into the organizationally, ethically, and materially situated activity that underlies what we, so far, have recognized as “the story.”

Notes

1. To provide a sense of this open-endedness, of 90 interviewer utterances in the first interview, 55 were “filler” language, such as “yeah,” “OK,” “mhm,” or “got it.” My substantive contributions – spaces where I moved interviews forward – were largely points of clarification, stemming from a dialogic process of repeating terms back to interviewees to clarify, expand, or provide examples for a given turn of phrase.
2. Two iterations of “story” that did not appear in proximity to “data” involved (1) “story” used to describe the story of MDC’s progress on specific projects, as told to funders, and (2) “story” as a promotional tool in pitching the report to stakeholders in person. This latter instance did not elaborate on the content of that story, so is unable to be coded definitively.
3. PUMAs are “public use microdata areas,” a geographic designation used by the Census Bureau (2018): “Public use microdata areas (PUMAs) are geographic areas defined to be used with public use microdata sample (PUMS) files. PUMAs are a collection of counties or tracts within counties with more than 100,000 people, based on the decennial census population counts. State partners define PUMAs once a decade after the decennial census. Data for PUMAs are available from the American Community Survey (ACS). PUMS files are available from the ACS and decennial census.”

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