RAPID INSTITUTIONAL CHANGE, PROFESSIONAL JOURNALISTS AND THE
RISE OF THE NEWS NERD

by

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ABSTRACT OF THE DISSERTATION

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Over the past several years, scholars and professionals alike have attended to the impact of digital transformation, and specifically to the increased role and relevance of data, analytics, and platforms. Due in part to the spread of networked devices, the proliferation of data, and the growing ubiquity of mobile Internet and computational capabilities, organizational transformation occurs at a rapid pace. In the U.S. news industry, for example, a new form of professional journalist is developing as news organizations increasingly hire programmers, coders, and data specialists and create teams dedicated solely to producing content for social media platforms and news applications.

While there is a long history of journalism studies that examine digital transformation, few have focused on the particular change processes related to shifting conceptions of the professional journalist. As the nature of the news industry continues to evolve at a rapid pace, more work is indeed required.
Institutional theory has a long-standing focus on how external social, economic, and technological forces impact taken-for-granted organizational structures and routines. Much of this work, however, takes a long-term perspective and does little to interrogate potential outcomes of the process of institutional change other than the expected institutionalization of something new as a taken-for-granted structure or failure of something new as a fad. In this time of constant and accelerated change, these perspectives may no longer be sufficient.

This research addresses these theoretical gaps by investigating the process of institutional change when it occurs in a rapid timeframe. To do so, this study focuses on a case study of recent transformation in the U.S. news industry—past the shift of print news organizations to the Web and the emergence of digital native news organizations, and towards a focus on changes related to the development of data, analytics, and mobile and social platforms. Of specific interest is change in the journalist profession from 2011 to 2016 and the development of news nerds—a new form of professional journalist at the intersection of news and data, analytics, and social and mobile platforms.

The results of this study support an alternative model of rapid institutional change and an unanticipated outcome of the process—institutional augmentation, which represents a process in which neither institutionalization nor failure occur. In other words, a new institutional structure has not displaced the existing institutional structure; instead, the existing institutional structure has augmented to allow for the coexistence of both. The findings regarding professional journalists suggest that institutional augmentation is a powerful explanatory mechanism for understanding the outcome of rapid institutional change.
An investigation into the factors that contribute to the likelihood that a journalist is a news nerd and that a news organization is a leader in news nerds further interrogates the process of rapid institutional change at both the actor level and the organizational level. As such, this study furthers understanding of the process, drivers, and outcomes of institutional change in a rapid time frame. In general, the findings of this research support an alternative model of rapid institutional change and an unanticipated outcome of the process, yielding crucial insight into the scholarship on institutional theory and journalism studies, as well as for the practical management of rapid change in a wide variety of industries.
Acknowledgements

The seeds for this dissertation were planted decades ago when my fascination with media evolved from an obsession with weekly newspaper comics and television reviews, to an appointment as editor-in-chief of my high school newspaper, to my professional experience in a TV newsroom. I witnessed first-hand the transformation occurring within the media world from the perspective of both avid consumer and professional producer. After a few years of reading many articles—both academic and industry—my fascination with the matter and questions concerning its future far outweighed the answers. This dissertation is a culmination of that passion, experience, and research. More importantly, it would not have happened without the help, support, and encouragement of many people along the way.

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Chapter 1:
Introduction

A headline in New York Magazine strikingly read, “What are these renegade cybergEEKS doing at The New York Times? Maybe saving it” (Nussbaum, 2009). The article focused on a team of developer-journalists, interactive producers, and visual editors tasked with creating experimental forms of storytelling at The New York Times. By capitalizing on developments in data, analytics, and platform capabilities, the team was able to create new forms of journalism, such as data-driven news applications and interactive graphics. While the majority of them are no longer at The New York Times, these cybergEEKS in the newsroom—news nerds, if you will—served as an early indicator of change in the journalist profession.

Indeed, there is a long history of journalism studies that examined digital transformation (e.g., Mitchelstein & Boczkowski, 2009); however, few have focused on the particular role of data and related concepts of programming and code (Lewis, 2015), especially with regards to professional journalists. Building on this history of change, recent transformation in the news industry has challenged the fundamental notion of what it means to be a journalist (Franklin, 2014). The nature of newsrooms is evolving quickly and requires new thinking around the emerging, “shifting digital-enabled configurations of news work” (Reese, in press, p. 1); yet a review of recent research suggests that understanding of this transformation is only skin deep.

Developments in digital technologies increasingly shape the world around us, accelerating change at a rapid pace (Hagel III & Brown, 2017). For example, the growing proliferation of data, coupled with advances in computational capabilities, facilitates
tracking and analysis on an unforeseen scale (Lewis & Usher, 2013). Third-party platform companies on mobile devices increasingly mediate and deliver the news to consumers (Newman, Fletcher, Kalogeropoulos, Levy, & Nielsen, 2017). Furthermore, consumers are less likely to accept the traditional offerings that drove organizational success in the past (Hagel III & Brown, 2017).

While many industries are disrupted by automation and computation, few have changed as rapidly and publically as the news industry (Bell, 2016). Decline in revenue is just one indicator of disruption as total revenue for U.S. newspapers has decreased more than 20% since 2011 (Barthel, 2017). The impact on employment of professional journalists is another indicator. Between 2011 and 2015, there was an 18% decrease in full-time reporters and editors at U.S. newspapers (Barthel, 2017).

The influence of this disruption is increasingly evident throughout the news industry as professional journalists are required to develop new ways to tell stories and engage with readers (Bell, 2015b). Indeed, technological developments, coupled with associated economic realities and social changes, continue to disrupt the established practices of the news industry. As such, these disruptions challenge what it means to be a professional journalist.

A new form of professional journalist is developing as news organizations hire programmers, coders, and data specialists (Aitamurto & Lewis, 2012) and create teams dedicated solely to producing content for social media platforms and news applications (Dowd, 2016). On April 27, 2017, the homepage of non-profit news organization ProPublica, for example, advertised eight open positions, six of which were focused on data or news applications (ProPublica, 2017). Quartz has a Things Team dedicated to
“data-driven, visual, and otherwise creative journalism” (Roush, 2016, p. 1) and Vox has a team solely focused on creating content for social media messaging application Snapchat (Ifeanyi, 2015).

News organizations have expanded beyond the boundaries of the traditional journalist job, from reporting and editing—narrowly defined—to incorporate data, analytics, and platform related positions—herein referred to as DAP. DAP journalist is an all-encompassing phrase used throughout this research to refer to this new form of professional journalist. While a more detailed explication is provided in Chapter two, DAP journalists can concisely be defined as those news industry professionals working in jobs at the intersection of traditional journalist positions and technologically intensive positions that were once generally separate. These journalists were referred to early on as “cybergeeks in the newsroom” (Nussbaum, 2009) and are now colloquially deemed “news nerds” (Owens, 2017).

The titles and specific responsibilities of DAP journalists vary; however, the commonality is a driving force to produce more effective and efficient news by harnessing the power of technological advancements such as the rise and accessibility of big data, computing technologies, networked devices, and mobile and social platforms. DAP journalists and the output of DAP journalists reflect the increasing dependence of journalism on digital technological developments (Lewis & Westlund, 2016). They are dependent on specific technological skills, but remains in the service of journalism and incorporated into the workflow of the established journalist profession.

Attention is only just beginning to be directed to the particular role of these new positions within the news industry (Lewis, 2015). They are indicative of the emergence
of new forms of newwork (Ananny & Crawford, 2015; Coddington, 2015) and new forms of professional journalists. The term professional journalist is used throughout this research to refer to those workers agreed upon by both fellow practitioners and the public as having the particular talent, knowledge, and education to fulfill the key role (Singer, 2003) of creating editorial projects for public consumption and in the public interest (Usher, 2016). Professionals are sustained with taken-for-granted norms regarding “who does what, under what circumstances” (Reay, Goodrick, Waldorff, & Casebeer, 2017, p. 1044; Scott, 2001). Any change in the agreed upon understanding of a professional journalist can thus impact the production of news, as well as organizational performance, and public perception of news. Given this influence, professionals play a significant role within the news industry and society at large.

In order to understand the changing nature of the professional journalist, institutional theory is implemented. Institutional theory has a long-standing focus on how professionals, and industry-wide norms more generally, become taken-for-granted routines (Meyer & Rowan, 1977). An institutional approach to change provides a foundation for examining the relationship between external social, political, economic, and technological forces and organizational structures and practices (Scott, 1995). It provides an appropriate theoretical approach to interrogating the way that change plays out with regards to professional journalists. Furthermore, recent scholarship calls for an institutional approach to studying transformation in the news industry (Ananny & Crawford, 2015; Anderson, 2013; Coddington, 2015).

Historically, professionals controlled their own fate (Reay et al., 2017) and determined their own definition and purview. Recent change (e.g., rapid advances in
digitalization, automation, and computation as discussed earlier), however, has increased the influence of external forces on work practices, positions, and professions in general. With that in mind, it is important to note, that institutional change is inherently longitudinal (Lawrence, Winn, & Jennings, 2001) and the majority of research takes a long-term perspective; a long-term perspective, however, may no longer be sufficient for understanding institutional change.

Indeed, an examination of professional journalists reifies the notion that change is occurring quickly. An interrogation of rapid institutional change thus provides an important and meaningful theoretical alternative. The notion of DAP journalists as an institutionalized form of professional journalists raises questions regarding the dynamics of institutional change—questions which are at the focus of this research and which aim to further understanding around the institutional change process, particularly when it occurs within in a rapid time frame.

Scholars, professionals, and commentators alike commonly attend to impact of digital transformation, and specifically to the increased role and relevance of data, analytics, and platforms. Due in part to the spread of networked devices, digitalization, and the growing ubiquity of mobile Internet, change is occurring not only within the news industry, but also in a diverse variety of industries. Take, for example, the rise of algorithmic trading in finance (Zuckerman & Hope, 2017), the emergence of web analytics that track online consumption (Petre, 2015), and the disruptive role of platforms in the travel and transportation industries (Evans & Schmalensee, 2016).

Ongoing technological development and advancement creates an environment of constant transformation where new types of skills, resources, processes, and
organizations rapidly emerge and disappear (Padgett, McMahan, & Zhong, 2012). This context sets the stage for rapid institutional change in which some new things emerge and become institutionalized and others fail as fleeting fads. This creates a practical dilemma, however, as organizations compete to attract the talent necessary to thrive and survive. In the specific context of this research, for example, news organizations struggle with weighing the costs and benefits of an investment in hiring DAP journalists.

Such challenges prompt critical questions about the complex dynamics surrounding institutional change in professionals. Of particular interest is an understanding of the process—and its outcome—when it occurs rapidly. In order to test this theoretical question and explore a new process of institutional change, this research focuses on the case of professional journalists. Specifically, it explores the degree to which DAP journalists is or is not institutionalized as a new form of professional journalist.

The role of news—and by extension, professional journalists—in the public sphere is increasingly more complex and important. Critical transformations have occurred in the ways that people consume news—as discussed, for example, in the development of social platforms and algorithmically tailored news feeds, tiny mobile screens, and the ability to entirely bypass news organizations and directly access the public. The news industry represents a case in which interactions among varying forms of professional journalists are occurring in a new and significant way.

This dissertation thus chronicles recent transformation of the U.S. news industry—past the shift of print news organizations to the Web and the emergence of digital native news organizations, and towards a focus on changes related to the
development of DAP journalists. The goal is an examination of rapid institutional change in the journalist profession, specifically from 2011 to 2016. This research builds from the collection of emerging scholarship and anecdotal evidence of the growth in professionals such as data journalists (Fink & Anderson, 2015), interactive journalists (Usher, 2016), and news application developers (Tourino, 2017) and works from the premise that there is a concerted increase in the prominence of professional news nerds throughout the news industry.

This premise provides the foundation to answer questions including the following: What factors contribute to the likelihood that a journalist is a DAP journalist? What factors contribute to the likelihood that a news organization is a leader in DAP news? Are DAP journalists an institution? In other words, are they taken for granted, accepted, and institutionalized as professional journalists? If not, what are DAP journalists as compared to traditional professional journalists? Either way, how and why did this rapid process of institutional change unfold? Finally, how does it differ from a traditional process of institutional change?

An institutional approach to these questions furthers understanding of the journalist profession and the complex dynamics surrounding the emergence and development of new professionals throughout the news industry. On the flipside, the examination of professional journalists offers a case for interrogating the process and outcomes of institutional change and contributes to the literature by providing an alternative model of the process when it occurs rapidly. Furthermore, this research offers implications of rapid institutional change for both the news industry at large and other industries as well.
In examining the intersection of institutional change and professional journalists, this research specifically contributes to three major scholarly conversations by: (1) focusing on the relatively neglected notion of rapid institutional change and identifying alternative potential outcomes of the process; (2) mapping the growth and impact of DAP journalists within the broader news industry; (3) investigating the process of rapid institutional change from a multi-level perspective.

First, the analysis of a combination of interviews with DAP journalists and archival news industry materials provides a comprehensive record and contextualization of institutional change, extending the scholarship to account for a rapid process with an alternative outcome aside from institutionalization or failure. In addition, the examination of thousands of journalist employment histories provides a unique and intricate dataset from which to analyze the development of DAP journalists and the movement of professional journalists throughout the news industry during a period of rapid change (2011-2015). The use of social network analysis on this data provides a map of both the current and yearly composition of the journalist profession. Finally, further quantitative analyses shed light on the factors driving rapid institutional change at both the actor level and the organizational level and highlight the differences between DAP journalists and traditional journalists at each. In general, this mixed-method approach also heeds recent scholarship calls for a combined statistical, qualitative, and social network analytical approach to institutional change (Ocasio, Thornton, & Lounsbury, 2017).

On a practical level, an examination of DAP journalists relates to the normative foundations of journalism in the sense that an understanding of professional journalists is central to an understanding of the role of journalism in society (Hanitzsch & Vos, 2017).
Indeed, professional journalists are intimately intertwined with the ethics and values of journalism, but are also an important factor in the production processes, financials, and business models of the news industry. As discussed, news organizations continue to struggle with understanding their own position, product, and purpose. An assessment of DAP journalists furthers understanding of the outcome of rapid institutional change and thus provides insight for organizational decision-making regarding hiring strategy.

An alternative model of institutional change—one that focuses on rapid change and provides an alternative outcome aside from institutionalization or failure—is, of course, relevant for industries other than news. This research provides insight into the mechanisms that drive rapid institutional change, which aids in understanding the difference between when something new is real (as in, an institution), when it is a trend (as in, a failed fad), and when it is something in the middle of that binary choice. This knowledge has the potential to aid organizational decision-making regarding investment of time and resources into new things, specifically new forms of professionals.

Indeed, by shedding light on rapid institutional change in professional journalists, this research also informs understanding of the process and outcomes in other industries. As such, this work heeds recent calls in journalism studies to extend research applications to other fields in an effort to increase relevance and foster cross-discipline conversations (Pickard, 2017). From both theoretical and practical perspectives, therefore, this dissertation examines a number of critical questions facing the news industry and beyond.

**Organization of the Dissertation**

The structure of this manuscript is as follows. Chapter 2 reviews the relevant literature on institutional change and professions, and proposes an examination of the
case of professional journalists. Building on prior work, a stage model of institutional change is explicated and applied to examine the case of rapid change in the journalist profession. The proposal of research questions and hypotheses is followed by an introduction to professional journalists and a review of recent change throughout the news industry, including an explication of the development of DAP journalists.

Chapter 3 details the data and methods utilized in this dissertation. A range of data sources such as interviews, archival industry materials, and publically available employment histories are used as the basis for a mixed-method analytical approach. Following a description of the data sources and overall analytic approach, three distinct research components are then delineated. Results of the analyses are provided in the fourth, fifth, and sixth chapters.

As the first of three findings chapters, Chapter 4 applies the model of institutional change to the context of the journalist profession to further understanding of a rapid institutional change process. The results of a qualitative analysis of interview data and archival industry materials shed light on the destabilization of established practices, entrance of new players, experimentation, legitimization, and diffusion with regard to traditional professional journalists and the development of DAP journalists. These findings support a process of rapid institutional change and set the stage for a discussion of alternative outcomes when neither reinstitutionalization nor failure of a new professional form occurs.

Chapter 5 reports findings from the social network analysis, which is used for a descriptive case study of professional journalists in New York City (NYC) news organizations. Network measures shed light on how the composition of the journalist
profession changed from 2011 to 2015. These findings also further understanding of the development of DAP journalists and specifically, as compared to traditional journalists.

Chapter 6 integrates both quantitative and qualitative findings. The results provide insight into the factors that contribute to the likelihood that a journalist is a DAP journalist, as well as the likelihood that a news organization is a leader in DAP news. In doing so, these results address rapid institutional change at both the actor and organizational levels.

Finally, Chapter 7 serves as the conclusion to the dissertation. This chapter discusses the implications of the research and highlights contributions to both theory and practice. It also provides an overview of the limitations of this research, as well as guidance for future research directions.
Chapter 2:  
Institutional Change and Professional Journalists

An Institutional Approach to Change

From a theoretical perspective, there are a number of possible avenues for examining macro-organizational transformation such as changes that occur at the industry level. Several approaches specifically provide insight into how structures—for instance, an industry’s profession, policies, and practices (Meyer & Rowan, 1977)—emerge and evolve with regard to the external environment. Strategic management literature, for instance, originates with the idea that these structures are strategically adapted responses to uncertain external elements (Hickson, Hinings, Lee, Schneck, & Pennings, 1971). Similarly, resource dependency theory (RDT) is premised on the notion that organizations require external resources for survival, which are influenced by an organization’s ability to manage dependencies on other organizations (Pfeffer & Salancik, 1978). In general, these theories both largely assume organizations are agency-laden actors responsible for boundedly rational adaption to external circumstances (Greenwood, Oliver, Sahlin, & Suddaby, 2008).

An institutional approach moves away from an agent-based focus in an effort to better conceptualize change as the result of interaction among broader external forces (Lewin, Long, & Carroll, 1999). The institutional focus offers an alternative response to the generally held notion that organizations can easily adjust strategies and structures to adapt to external conditions and to improve performance (Haveman & David, 2008). Furthermore, this lens highlights the role of institutionalized ideas, beliefs, rules, and
messages (Lammers & Barbour, 2006), bringing greater attention to the meaning systems that engender organizations.

Institutional theory has a long-standing focus on how practices become routinized and taken-for-granted (Meyer & Rowan, 1977). According to Scott (1995), “institutions consist of cognitive, normative, and regulative structures and activities that provide stability and meaning to social behavior. Institutions are transported by various carriers – culture, structures, and routines – and they operate at multiple levels of jurisdiction” (p. 33). An institutional approach to change provides a foundation for examining the relationship between broader social, political, economic, and technological forces and organizational structures and practices (Scott, 1995).

Early institutional studies portrayed efficient change as a challenge due to the necessity of compliance with various institutional structures; as such, this compliance was oftentimes symbolic and decoupled from an organization’s core technical activities (Meyer & Rowan, 1977). Powell and DiMaggio (1991) expand on that foundational premise by explicating the role of institutional rules in legitimizing organizational structures. Indeed, an institutional approach attends to the ways that external forces impact organizational action by providing meaning through regulative, normative, and cognitive systems (Scott, 1995).

While the foundational scholarship tended to focus on persistence, stability, and compliance throughout an industry (Slack & Hinings, 1994), more recent scholarship turned toward a broad focus on understanding how institutional structures change (Dacin, Goodstein, & Scott, 2002). Of specific interest were topics such as who or what initiates institutional change (Leblebici, Salancik, Copay, & King, 1991), resistance to change
Institutional Change in Professions

An institutional approach to professions offers a framework that accounts for change in an industry’s taken-for-granted understanding of its workers. Leicht and Fennell (2008) define a profession as those occupational incumbents for whom control over a task relates to explicit knowledge from training. The primary duties of a profession are only realized by those with particular talent, knowledge, or education (Allison, 1986).

Professions hold an important role in society and historically, professions were stable and in control of their own purview (Abbott, 1988). Recent scholarship, however, has attended to the influence of external pressures on the work of professions (Reay et al., 2017). As one example of an institutional structure, professions represent a mechanism for ordering, creating, and providing meaning to a distinct area of organizational life (Muzio, Brock, & Suddaby, 2013).

It follows, then, that professions are institutionally shaped by a variety of forces that can change from a combination of new people, places, and technologies, which would thus push professions into new and unexamined areas (Leicht & Fennell, 2008). In other words, such change influences the construction of professions as organizations strive to communicate alignment with institutional norms and practices (Glynn, 2008). Any change in a profession thus impacts the taken-for-granted understanding about who
does what and when (Reay et al., 2017; Scott, 2001), and thus attention should be directed at the process of institutional change in professions (Kitchener, 2000).

Indeed, the relationship between professions and institutional change is an intimately intertwined path. Institutional change in professions, specifically within the context of the external environment within which work takes place, can occur along three different dimensions: content and procedures; terms and contracts (e.g. pay and hours); and conditions, which includes changes in staffing and resources (Leicht & Fennell, 2008). A growing body of work applies an institutional change perspective to the study of professions (Scott, 2008). Burrage, Jaraush, and Siegrist (1990), for example, offered a model explaining how professions are influenced by broader institutional structures.

Contemporary work carries this foundational concept forward as well. For instance, Greenwood, Suddaby, and Hinings (2002) found that through institutionalized routines of licensing, training, and monitoring, professional associations played the most significant role in changing the jurisdictional boundaries of the profession of accountants over 20 years. Singh and Jayanti (2013) also highlighted the impact of professional associations in changes in professional work. Implicit in this work is attention to professions as connected to broader institutional patterns and norms (Muzio et al., 2013).

In the professional context of management consulting, for example, Kipping and Kirkpatrick (2013) found that change was greatly influenced by emergent organizations. Along similar lines, Daudigeos (2013) found that the emergence of occupational health managers as a new profession led to an increasing focus on health and safety throughout the construction industry. A core contribution of this realm of scholarship is the recognition of evolving conceptions of professions throughout a variety of industries and
the interconnectedness of professional, organizational, and institutional transformation (Adler & Kwon, 2013).

It is important to note that the majority of research on institutional change in professions takes a relatively long-term perspective. A review of 16 empirical studies on institutional change and professions shows that the average time period of examination is approximately 15 years. Table 2-1 summarizes these key studies and provides information on the research subject and time period of examination.
Table 2-1

Key Empirical Studies on Institutional Change and Professions

<table>
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<th>Author (Year)</th>
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<tr>
<td>Daudigeos (2013)</td>
<td>Construction</td>
<td>Unknown</td>
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<td>Reay et al. (2017)</td>
<td>Health</td>
<td>2004-2012</td>
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<td>Wright et al. (2017)</td>
<td>Health</td>
<td>2009-2012</td>
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Note. Articles included in this table were collected through a search of Business Source Complete database. Search terms included “institutional change” and “profession” in the abstract (AB) field and “empirical” in the full text (TX) field. Results were filtered for articles in peer-review journals including Academy of Management Journal, Administrative Science Quarterly, Journal of Change Management, Journal of Management Studies, Organization Studies, and Organization.
In sum, this work highlights the impact of external forces on institutional structures such as professions. In general, however, studies on institutional change are incremental and path dependent (Gorges, 2001) and lack a deep understanding of if and how the institutional change process can occur through different pathways (Miciełotta, Lounsbury, & Greenwood, in press). Based on this review, few of the studies on institutional change in professions specifically attend to the possibility, and more importantly, the significance of institutional change processes that occur in a rapid time frame. This gap in the research provides the theoretical focus on this dissertation, which in turn leads to the following overarching research questions:

**RQ1:** How does institutional change occur in a rapid time frame?

**RQ2:** How does a model of rapid institutional change differ from a traditional model of institutional change?
The Process of Institutional Change

An institutional approach can be used to better understand the process of change in professions. As discussed, while many studies have attended to the triggers and outcomes of institutional change, few have systematically theorized the connection between the two (Micelotta et al., in press). Recent institutional scholarship has specifically called for the examination of institutional change processes as opposed to simply explicating the nature of institutions (Greenwood et al., 2008).

Greenwood et al. (2002) provide one notable exception; the authors build from a comprehensive review of the literature to delineate the process of institutional change. Figure 2-1 illustrates this model as occurring in six stages: precipitating jolts, deinstitutionalization, preinstitutionalization, theorization, diffusion, and reinstitutionalization. Although originally applied to an examination of accountants over a period of 20 years, the model is used here as a starting point for unpacking the various stages of institutional change. In the following chapters, the model is then assessed with regard to its applicability for rapid institutional change, specifically in the journalist profession.
Precipitating Jolts

Institutional change is precipitated by jolts in the external environment such as social, technological, or regulatory triggers (Greenwood et al., 2002) that disrupt stabilized practices of an industry. Early studies of institutional change focused on exogenous jolts occurring at the societal level (Meyer, 1982), for example, technological developments, regulatory changes, and social upheaval, and the effect these changes have on industries. Allmendinger and Hackman (1996), for example, examined the impact of the rise and fall of socialism in East Germany on German orchestras. Cooper et al. (1996) identified the influence of changes in discourse on the organizational structures and systems of law firms. Further studies examined the impact of technological developments on organizational structures in hospitals (Barley, 1986) and the influence of regulatory change on the U.S. chemical industry (Hoffman, 1999).

Together, these studies highlight the impact of macro-level disruption on established industries in triggering institutional change. Other research on the precipitating triggers of institutional change includes a more agentic focus on institutional
entrepreneurs—agents of change with an interest in particular institutional structures and the resources to change them (Maguire, Hardy, & Lawrence, 2004) and a practice-oriented focus on change driven by the “mundane activities” of workers (Smets et al., 2012, p. 877). In sum, this work holds that precipitating jolts create uncertain and tense conditions that stimulate institutional change (Hardy & Maguire, 2008).

**Deinstitutionalization**

Uncertainty thus creates an opportunity for deinstitutionalization, which is characterized by the emergence of new entrants introducing new ideas, possibilities, and efforts at change (Greenwood et al., 2002). Research on deinstitutionalization is often focused on initiators of institutional change and those coming from outside the traditional boundaries on an industry. As peripheral players, these new entrants are more adept at developing ideas of change, as they are less likely to be connected to established players and therefore less constrained by institutional norms and practices (Hardy & Maguire, 2008).

Leblebici et al. (1991), for example, highlighted the role of fringe players that introduced new practices to the U.S. broadcasting industry, which were then adopted by established players and thus initiated institutional change. Similarly, in the context of management consulting, Kipping and Kirkpatrick (2013) found that organizations entering outside the traditional boundaries of the industry introduced new models of organizing that led to institutional change. The role of new entrants is also depicted in the case of Napster, which disrupted established practices of the music industry (Hensmans, 2003) and non-governmental organizations (NGO), which were significant for the institutionalization of recycling practices (Lounsbury, Ventresca, & Hirsch, 2003).
Oftentimes, new entrants initiate change because they are disadvantaged by existing institutional arrangements (Leblebici et al., 1991). Other times, they are identified as those with the resources or ability to solve specified problems in an industry (Hardy & Maguire, 2008). Such was the case, for example, when declining performance in accounting organizations triggered an emergent alternative to the traditional organizational form (Greenwood & Suddaby, 2006).

**Preinstitutionalization**

Preinstitutionalization is characterized by the introduction and initiation of the formalization of new institutional structures. This third stage of institutional change occurs when a few organizations independently begin to adopt a new structure in an ad-hoc manner (Greenwood et al., 2002). It is thus a stage reflective of exploration, experimentation, and evaluation.

Preinstitutionalization builds on Tolbert and Zucker’s (1996) explication of habitualization, which “involves the generation of new structural arrangements in response to a specific organizational problem or set of problems, and the formalization of such arrangements in the policies and procedures of a given organization” (p. 181). At this stage, there are very few adopters of a new institutional structure and the extent of implementation varies considerably. Preinstitutionalization represents the beginning of establishment and formalization of something new.

**Theorization**

Within the process of institutional change, theorization represents the stage during which accounts of change are simplified in an effort to further adoption of new structures (Abbott, 1988). This is typically accomplished through the specification of a problem for
which a new alternative is presented as a solution and then accompanied by the justification for said new alternative (Tolbert & Zucker, 1996). Nielsen and Riiskjer (2013), for example, found that institutionalization of a new tool throughout hospitals only occurred with acceptance (legitimacy), attention (specification), and opportunities for action (justification).

In this way, theorization is also connected with the establishment of legitimacy, which is a central component of institutional theory (Greenwood et al., 2002). Legitimacy is the socially constructed general perception of appropriateness (Suchman, 1995). It is a taken-for-granted understanding of reality that plays an important role in institutional change (Suchman, 1994).

Legitimacy can take a variety of forms depending on the context and the audience (Scott, 1995). Bitektine (2011) synthesized these forms by arguing legitimacy as a perception, a judgment, or the consequences of perception and judgment as “manifested in actors’ action” such as acceptance or endorsement (p. 152). Suchman (1995) provided a breakdown of typologies that includes moral legitimacy (normative approval), pragmatic legitimacy (self-interest), and cognitive legitimacy (comprehensibility and taken-for-grantedness).

**Moral legitimacy.** The stage of theorization represents the justification and articulation specifically of moral legitimacy (Tolbert & Zucker, 1996). Moral legitimacy is the “nesting of new ideas within prevailing normative prescriptions” (Greenwood et al., 2002, p. 60). The moral legitimacy of something new is evident, for example, when it is integrated into industry norms such as training and policies. Here, the premise is based on
the recognition that skill, effort, and practice are each also necessary conditions for legitimacy (DiMaggio & Powell, 1991).

Institutionalization of something new is dependent on the recognition of appropriateness by condoned players within an industry (Lowrey, 2012). The adoption of something new by a few others—as in the case of preinstitutionalization—indicates a level of effectiveness that increases legitimacy and encourages wider adoption and diffusion (Lee & Pennings, 2002). This occurs as organizations model themselves after others that are perceived as legitimate and develop a common exchange patterns (DiMaggio & Powell, 1983). It is thus expected that institutional change will be positively related to moral legitimacy, and this is hypothesized as follows:

H₁: Rapid institutional change is positively associated with moral legitimacy.

**Diffusion**

The theorization stage is followed by diffusion, during which something new is adopted and gains further legitimacy—in this case, pragmatic legitimacy—until it reaches the final stage of institutional change (Greenwood et al., 2002). Indeed, diffusion only occurs if new ideas are compellingly specified and justified during the stage of theorization (Strang & Meyer, 1993). In other words, as something new is theorized, it gains legitimacy (Suchman, 1995) related to the industry’s morals and norms; the new idea becomes objectified, gaining pragmatic legitimacy, and thus diffuses further throughout the industry (Tolbert & Zucker, 1996).

**Pragmatic legitimacy.** Pragmatic legitimacy is grounded in self-interest and functional superiority (Suchman, 1995). This type of legitimacy involves the linking of something new with actual economic outcomes (Greenwood et al., 2002). In other words,
diffusion signals pragmatic legitimacy, an increase in shared understanding and coordinated planning that engenders routine (Lowrey, 2012). When something new is widely valued in this pragmatic way, institutionalization is anticipated (Hall & Taylor, 1996). Thus, it is expected that institutional change will be positively related to pragmatic legitimacy. This is hypothesized as follows:

\[ H_2: \text{Rapid institutional change is positively associated with pragmatic legitimacy.} \]

**Mimetic isomorphism.** In addition to pragmatic legitimacy, diffusion necessitates instantiation at the micro level (Heinze, Soderstrom, & Heinze, 2016). In other words, while institutional change typically begins with macro-level disruption, adoption occurs at the organizational level. Scholarship on this stage often examines mechanisms such as mimetic isomorphism that lead to a field-level homogenous response by organizations (DiMaggio & Powell, 1983; Dimmick, Chen, & Li, 2004).

Indeed, mimetic isomorphism is a central tenet of institutional theory. It is used to explain how organizations model the successes of others within the industry in order to conform to expectations and enhance legitimacy (DiMaggio & Powell, 1983). Mimetic isomorphism typically occurs in uncertain and rapidly changing contexts and is often decoupled from pragmatics and internal efficiency demands (Meyer & Rowan, 1977).

**Variation in diffusion.** Questions remain, however, regarding the impact of pressures to conform when organizations are seemingly varied in their response to institutional change (Gorges, 2001). For a long time, little was known about the variety of ways organizations responded to institutional change (Greenwood & Hinings, 1996; Oliver, 1991) or the reasons for variation in adoption of new institutional structures (Lounsbury, 2001). Recent scholarship has increasingly attended to the variation in
organizational responses to institutional change that leads to heterogeneity (Heinze et al., 2016).

At the organizational level, two examples of factors are examined for their relationship with institutional change: organizational age and organizational size. Age is important because as organizations age, experience leads to established routines (Nelson & Winter, 1982). As such, older organizations tend to have greater resistance to change and the adoption of new structures (Stinchcombe, 1965). Size is similarly important, as larger organizations also tend to be more resistant to change (Weber, 2010). In addition, larger organizations are more visible and thus more likely pressured to remain conformed to the already established and legitimate structures (Lounsbury, 2001). Thus, it is expected that organizational-level institutional change will be negatively related to both age and size. The relationship to age and size is hypothesized as follows:

H₃: Rapid institutional change is negatively associated with organizational age.

H₄: Rapid institutional change is negatively associated with organizational size.

Furthermore, while the stages of institutional change have received scholarly attention, little scholarship has paid heed to the process from a multilevel perspective (Heinze et al., 2016). Diffusion not only varies at the organizational level, but at the actor level as well. In other words, one way by which response to institutional change can vary is at the level of professionals themselves. As discussed earlier, studies of institutional change in professions have long examined external influences on the diffusion of something new, but few have examined the sources of variations in professional diffusion (Scott, 2001; Thornton & Ocasio, 1999).
Prior experience, for example, contributes to the likelihood that something new will diffuse at the actor level. Individual professionals are the result of their work experiences (Benson, 2006). The work histories of individual professionals are thus an integral contribution to any model of innovation (Kreiss, in press) or institutional change process. While new entrants from outside the industry often initiate change (Hardy & Maguire, 2008), as the institutional change process continues, those that change tend to be central players within the industry (Rao, Monin, & Durand, 2003). Thus, it is expected that as rapid institutional change progresses, actor level change will be driven from within the industry itself. This is hypothesized as follows:

\[ H_5: \text{Rapid institutional change is more likely to be driven from within an industry than from external sources.} \]

**Reinstitutionalization or Fad**

The final stage of institutional change occurs when something new is either reinstitutionalized as the taken-for-granted, “natural and appropriate arrangement” (Greenwood et al., 2002, p. 61) or ultimately rejected as a fleeting fad. As compared to full institutionalization, there are relatively few examinations of failure as an outcome of institutional change (Micelotta et al., in press). Recent notable exceptions include, for example, the examination of the failed institutionalization of new nursing and medical rules in the English National Health Service (Currie et al., 2012) and the examination of the failed institutionalization of Italian professional service sector reform (Micelotta & Washington, 2013).

Successful institutionalization of something new, on the other hand, indicates that it has reached a taken-for-granted status and a general level of stability. It is expected to
survive over time, irrefutably accepted as the authoritative structure (Tolbert & Zucker, 1996). Fully institutionalized structures include, for example, multi-disciplinary teams of health care professionals in Canadian patient services (Reay et al., 2017), tenure policies among U.S. higher education organizations (Thornton & Ocasio, 1999), and the measurement of the audience as the currency of the U.S. TV marketplace (Napoli, 2011).

Cognitive legitimacy. Institutionalization occurs as the diffusion provides the new structure with cognitive legitimacy, which involves an increase in public knowledge, awareness (Hannan & Freeman, 1986), and acceptance of a new idea by external stakeholders (Suchman, 1995). A central tenet of this type of legitimacy is the idea that legitimacy is located within the audience as a shared and taken-for-granted perception (Colyvas & Powell, 2006). As such, cognitive legitimacy is generally understood through the observations and assessments of those external to an industry’s professionals such as through media coverage (Deephouse, 1996) or awards, which can be understood as “tournament rituals” that shape the configuration of organizational fields and thus impact institutional change (Anand & Watson, 2004).

Rao et al. (2003), for example, found that institutional change in French gastronomy occurred as chefs attended to the reputational gains (as determined by coverage by industry critics) of others adopting the new cuisine. Similarly, Anand and Jones (2008) found that institutional change in English literature occurred through a championing of a distinct category by the Booker Prize for Fiction. It is thus expected that rapid institutional change will be positively related to cognitive legitimacy. This is hypothesized as follows:

H₆: Rapid institutional change is positively associated with cognitive legitimacy.
**The Case of Professional Journalists**

In order to address the outlined research questions and associated hypotheses, this study focuses on the case of professional journalists. There is a long history of institutional approaches to the study of the news industry (Moe & Syvertsen, 2007; Napoli, 2014). While much of this work traditionally focuses on news as an institution in and of itself (Cook, 2005; Schudson, 2002), scholars have recently started using an institutional approach to examine how external social, technological, economic, and political forces institutionally shape structures within the industry.

Lowrey (2011), for example, found that news organizations tend to reinforce institutional norms while struggling to innovate during uncertain times; specifically, organizations were decoupling internal production processes from external manifestations of industry trend adoption. Other studies—if not explicitly, then at least implicitly—also reflect institutional tendencies of news organizations. Isomorphism, for example, is evident throughout the industry as the imitation found in news organizations’ adoption of technological innovations (Boczkowski, 2010).

Furthermore, incumbent resistance is reflected in the continued support of the status quo (Boczkowski, 2010), as legacy news organizations struggle to incorporate new digital processes into news production (Naldi & Picard, 2012). Boczkowski (2004) examined legacy news organizations shifting to digital production, and highlighted the ways organizational and professional dynamics challenge the news industry’s relationship with change. Similarly, Ryfe (2012) concluded that journalists in a case study of three newsrooms did not adapt well to innovation because of their strong institutionalized norms, which often conflicted with change.
On the other hand, Lewis and Westlund (2015a) explicated an institutional approach, calling for theoretical frameworks that account for changes in the interconnections among human actors, technological actants, audiences, and activities that comprise the news industry. Katzenbach (2011) applied an institutional perspective to media governance of technology that enabled better description and analysis of regulatory change. Similarly, Napoli (2014) encouraged an institutional framework for analyzing the role of algorithms throughout the media industry.

In that light, this work considers institutional change in professional journalists and, more broadly, throughout the news industry as comprised of a variety of organizations engaging in common activities and subject to similar institutional pressures (Ananny & Crawford, 2015). This perspective follows the work of Kreiss (in press) in striving “to account for the people who actually do the work” (p. 19). Furthermore, it heeds recent calls in journalism scholarship to interrogate transformation within the wider context of changes in work and employment (Dickinson, 2007; Ornebring, 2009).

**Professional Journalists**

As discussed, professions can be primary targets of institutional change, impacted by broader social, economic, technological, and political forces (Muzio et al., 2013). The term profession refers to those workers agreed upon by both fellow practitioners and the public as having the particular talent, knowledge, and education to fulfill a key role (Singer, 2003). Any change in the agreed upon understanding of the journalist profession can thus impact the production of news, as well as organizational performance and public perception of news. The journalist profession has influence on the cognitions and
behaviors associated with the news industry, essentially functioning as a guiding routine or norm; in other words, as an institutional structure (Jepperson, 1991).

While the specific attributes that make up the notion of a professional journalist vary, there is considerable agreement surrounding a few general dimensions (Singer, 2003). Following an institutional approach, these dimensions can be broken down into cognitive, normative, and regulative categories. Respectively, professional journalists apply a mastery of skills and a body of knowledge to their work, which is self-regulated due to distinctive codes and ethics, and autonomous and prestigious as compared to others (Singer, 2003).

The news industry maintains certain agreed upon expectations regarding the meaning of a professional journalist; these dimensions create an ideology that serves to continuously reinforce that consensus (Deuze, 2005). Traditionally, there is no sanctioned body of knowledge that defines the profession; however, core skills such as reporting and writing are identifiable. Introductory textbooks typically define a journalist as someone who reports and writes accurate information for dissemination to a wider audience (Singer, 2003). While the news industry does not have a regulatory entrance exam, as is the case in many other professions, professional journalists share a broad code of conduct, standards of practice, and ethical guidelines that focus on the imperative to serve in the public interest (Deuze, 2005). This includes dominant journalistic structures such as the AP Stylebook, professional associations (e.g., The Society of Professional Journalists and Online News Association), and accrediting agencies such as the Accrediting Council on Education in Journalism and Mass Communication.
Yet, “agreed upon expectations” are oftentimes insufficient for maintaining an impenetrable understanding of the journalist profession. Lacking a sanctioned body of knowledge, professional journalists struggle to maintain exclusivity (Powers, 2012). Professional journalists are sometimes categorized as those skilled in information-gathering, other times as those skilled in information-presentation, and even as those skilled in a combination of both and in addition to audience interaction (Ornebring & Mellado, in press). The guiding principle behind professional journalists is often reduced to the importance of unbiased and fact-based reporting (Powers, 2012), and even that authority is currently contested (Carlson, 2017). Indeed, the journalist profession faces challenges to its control and exclusivity (Lewis, 2012).

There is no dearth of recent scholarship on the changing definition of professional journalist (Deuze, 2005; Ferrucci & Vos, in press). While the boundaries were perhaps more simple in the past and grounded in a professional ideology and code of ethics, emergent actors have entered into the industry increasingly blurring these lines (Knight, Geuze, & Gerlis, 2008). In sum and in following Usher (2016), this research uses the term journalist to reflect those news industry professionals who conform with dominant norms and contribute to creating editorial projects for public consumption and in the public interest.

**Recent Change in the Journalist Profession: DAP Journalists**

These exclusivity challenges combined with advancements in the technologies used to produce news have contributed to recent change in the profession, including the rise of new forms of professional journalists. There is a great deal of work on the tensions between new and existing forms of newswork (Ornebring & Mellado, in press) and it is
well established that professional journalists have long used technologies to accomplish their work (Lewis & Westlund, 2015b). Indeed, technological development is often a stimulus for the possibility of new professional forms (Powers, 2012). (Lewis & Westlund, 2016) interrogate this relationship between technology and journalism by introducing a spectrum of the dependence of various forms of newswork on various forms of technology including four classifications from human-centric journalism to technology-supported journalism to technology-infused journalism to technology-oriented journalism. This spectrum helps shed light on the wide range of newswork activities and their varying dependence on technological actants.

In addition to new technologies, however, new forms of professional journalists are also connected to changing social conditions such as the increasing demand for mobile and social content, as well as changing market conditions such as the increasing financial challenges and competition. In a recent assessment of the news industry, Anderson, Bell, and Shirky (2014) declared that the news industry is no longer predictable; uniform editorial processes, revenues, and professional identities are elements of a past profession. “The extent to which a journalist now needs to have in-depth knowledge about something other than journalism is increasing;” in addition to storytelling skills, modern professional journalists require data literacy, an understanding of metrics and audiences, and coding capabilities (Anderson et al., 2014, p. 34). The classic view of a professional journalist as an objective reporter, writer, and storyteller no longer stands as a sufficient paradigm.

DAP journalists. To wit, a new form of professional journalist continues to develop as news organizations increasingly hire developers, programmers, coders, and
data specialists (Aitamurto & Lewis, 2012). Take, for example, the rise of interactive journalism and the journalists who produce it through a combination of software programming and storytelling skills (Usher, 2016). There is also an increasing presence of journalists focused on social media content (Chadha & Wells, in press; Ross, in press) and analytics of audience behavior data utilized to better calibrate newsgathering activities (Anderson, 2011) and even to produce news. Furthermore, collaboration between traditional journalists and technology application designers is increasingly encouraged to generate new news technologies (Ananny & Crawford, 2015) and the training of hybrid programmer-journalists (Parasie & Dagiral, 2012).

Taken together, these developments represent the emergence of new forms of newswork (Ananny & Crawford, 2015; Coddington, 2015) and professional journalists. These developments are indicative of a new “wave” of journalism transformation (Bell, Owen, Brown, Hauka, & Rashidian, 2017, p. 16). This wave reflects transformation beyond the transition from print to digital, and toward a focus on professional journalists working at the intersection of news and Data, Analytics, and/or mobile and social Platforms (herein referred to as DAP journalists).

DAP journalist is an all-encompassing phrase used throughout this research to refer to this new form of professional journalist; the following paragraphs delineate the variety of positions, responsibilities, skills, and output represented by DAP journalists as a whole. DAP journalists hold a variety of job positions throughout the news industry, for example, data editor, audience development editor, and news applications editor. The common thread behind each of these positions is a driving force to produce more effective and efficient news by harnessing the power of technological advancements such
as the rise and accessibility of big data, computing technologies, networked devices, and mobile platforms. Harkening back to Lewis & Westlund’s (2016) spectrum of journalism’s dependence on technology, these DAP journalists can be viewed as technology-infused journalists: journalists “institutionalizing technology for production and distribution – and, as a result, becoming increasingly dependent on technological actants even as they become empowered by them” (p. 347). The work of DAP journalists is not simply supported or augmented by technological developments, but dependent on and intricately intertwined with them.

Responsibilities of DAP journalists take the form of activities such as building tools, creating graphics, making interactive story templates, or analyzing large datasets. Skills range from web development, to coding and programming, to data analytics and visualization. Importantly, DAP journalists are reporters, journalists, and editors—proficient in writing and news judgment, and working in the name of producing better stories and making sure they get to and engage the right audiences. Indeed, visual storytelling and data journalism continue to rise throughout the industry, and moving stories beyond words is a critical component for newsrooms everywhere. Understanding and working with data is also a prized skill, as is being able to tell stories that resonate socially.

The output of DAP journalists also varies widely, ranging from traditional text or visual stories driven by investigation of large datasets, to tailored editorial production and distribution priorities grounded in audience analytics, to interactive graphics or news applications created via web development or programming. For example, The Tampa
Bay Times investigative series, “Failure Factories,”¹ which appeared both online and in print, was driven by analysis of a large-scale dataset from the Florida Department of Education. Within the broadcast sector of the news industry, DAP journalism is reflected in NBC News’s investigation of a dataset on sexual assault in the military.² Another example of DAP journalism is The Wall Street Journal’s social media coverage of the killing of two WDBJ journalists on live TV, which was fueled by real-time audience analytics.³ DAP journalism also includes interactive features such as, and perhaps most famously, “Snow Fall: The Avalanche at Tunnel Creek” by The New York Times, which integrated text, photos, videos, graphics, animations, maps, and code to create a standalone news application.⁴

Indeed, DAP journalists and the output of DAP journalists are dependent on specific technological skills, but they remain in the service of journalism and incorporated into the workflow of the established journalist profession. Thus, it is important to clarify, however, that DAP journalism is not about the technological developments per se, but reflective of the way that technology impacts the job of professional journalists. DAP journalists represent the merging of data, analytic, and platform responsibilities and expertise with storytelling that were once, generally separate.

Of course, not all of these positions are fundamentally new. Data journalism, for example, grew out of computer-assisted reporting (CAR) beginning in the 1950s (Li, ¹ http://www.tampabay.com/projects/2015/investigations/pinellas-failure-factories/
³ https://www.facebook.com/wsj/posts/101536540044448128
2013). While a detailed history is outside the scope of this work (see, e.g., Anderson, 2014; Howard, 2014; Usher, 2016), the goal here is instead to understand the path of change—grounded in technological development, but enacted in the name of news and storytelling—in the prescribed positions of professional journalists that were not possible in the past.

The development of new forms of professional journalists provides a fruitful context to investigate the dynamics of the news industry and thus the process of rapid institutional change. As such, this work offers an analysis of rapid institutional change in the U.S. news industry, the development of DAP journalists as a new form of professional journalists, and an investigation into DAP journalists as an institutionalized structure. In addition to the earlier proposed research question and hypotheses, of specific interest here is the composition of the journalist profession and how it has changed over the last several years:

RQ3: How has the composition of the journalist profession changed from 2011 to 2016?
The following chapter outlines a methodological approach to assessing a process of rapid institutional change, specifically focusing on the case of the journalist profession. This work follows the call of Reay and Hinings (2005) to examine institutional change during moments of restructuring, as opposed to focusing on explanations of the sources of the disruption. As such, data were collected to capture the critical period of rapid change from 2011 to 2016, during which the news industry was in the midst of grappling with new professional positions and skillsets resulting from ongoing technological disruption and associated changes in news production and consumption.

To that end, 2012 marks the first time that employment numbers in Internet publishing and web search portals surpassed a traditional news format—television broadcasting—at 121,045 and 120,294 jobs, respectively (Bureau of Labor Statistics at US Department of Labor, 2017). Thus, data on professional journalists are collected beginning one year prior to this milestone in 2011. Internet publishing jobs later surpassed newspaper jobs in 2015 (Bureau of Labor Statistics at US Department of Labor, 2017). Furthermore, 2016 is the most recent year with complete data available.

These shifts in employment in news production are accompanied by shifts in news consumption. The percentage of U.S. adults who consume news on mobile devices has increased dramatically, while online (i.e., desktop/laptop) usage continues to remain stable (Mitchell, Gottfried, Barthel, & Shearer, 2016). The combination of the maturity of online news and the introduction of new mobile and social platforms such as Snapchat and Apple’s Newsstand app (Bell et al., 2017), paired with emergent milestones noted in
background interviews with professional journalists, suggests 2011 as an appropriate starting point for collection of data through 2016. Indeed, the 2010s represent a “constitutive moment” (Usher, 2016, p. 3) for DAP journalists. The focus of this analysis is thus specifically on 2011 through 2016 to provide insight into professional journalists and institutional change during this rapid time of industry restructuring.

In order to examine this period of change and answer the proposed research questions and hypotheses, a mixed-method approach is used. The goals of this approach are to model a process of rapid institutional change and further understanding of how it might differ from existing models of institutional change (RQ1 and RQ2), examine the composition of the journalist profession from 2011 through 2015 (RQ3), and test the six hypotheses regarding rapid institutional change at both the actor and the organizational levels (H1-H6). A mixed-method approach enables the combination of qualitative and quantitative methods, highlighting collective strengths while compensating for individual weaknesses of each individual methodological approach (Brewer & Hunter, 2005).

This dissertation uses a combination of qualitative and quantitative analyses to provide an enhanced and synthesized understanding of the research phenomena. Furthermore, the use of a variety of data sources and mixed methods enables a triangulation process (Creswell, 2009) of comparison, analysis, and interpretation that provides a more nuanced understanding of the research phenomena. Table 3-1 presents a summary of the mixed methods, data sources and analytical procedures, which are then discussed below in greater detail.
Table 3-1

Mixed Methods Research Design

<table>
<thead>
<tr>
<th>Method</th>
<th>Data Source</th>
<th>Analytical Procedure</th>
<th>RQs &amp; Hs</th>
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<tr>
<td>Qualitative data analysis</td>
<td>- Interviews&lt;br&gt;- Archival materials (e.g., industry press articles and reports)&lt;br&gt;- Participant observation</td>
<td>- Narrative coding&lt;br&gt;- Grounded theory coding</td>
<td>RQ1, RQ2, RQ3</td>
</tr>
<tr>
<td>Social network analysis</td>
<td>- Case study of NYC news organization employee work histories</td>
<td>- Longitudinal network visualizations and measures (e.g., degree centrality and betweenness centrality)</td>
<td>RQ3</td>
</tr>
<tr>
<td>Quantitative data analysis</td>
<td>- Journalist employment histories&lt;br&gt;- News organization degree centrality scores&lt;br&gt;- Public organizational data</td>
<td>- Binomial logistic regression&lt;br&gt;- Multivariate linear regression</td>
<td>H1, H5 RQ1, RQ2 H2, H3, H4, H6 RQ1, RQ2</td>
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**Data Sources**

Data sources include the following: semi-structured interviews with professional journalists, industry trade press articles, participant-observation of industry conferences, publicly available employment histories, journalist job listings, and two organizational research databases. Data collection procedures for each of these sources are outlined in the following sections. This discussion is then followed by a delineation of the three research components designed to examine rapid institutional change and professional journalists and test the proposed research questions and hypotheses.

The research design is comprised of three components: (1) a contextualization of rapid institutional change in the journalist profession and the increasing prominence of DAP journalists; (2) a case study of New York City news organizations, which provides a high level view of employment networks of professional journalists from 2011 through 2015; (3) an integrated analysis of rapid institutional change, specifically aimed at indentifying factors that contribute to the likelihood that a journalist is a DAP journalist and that an news organization is a leader in DAP news.

**Semi-structured interviews.** Semi-structured, in-depth interviews were conducted with professional DAP journalists. Interviews are often used in studies of institutional change and professions (Empson, Cleaver, & Allen, 2013; Ramirez, 2013) to provide detailed illustrations and further understanding of change processes. In general, the goal of the interviews is to get a broad sense of the industry’s approach and response to recent rapid transformation, especially with regard to change in professional journalists. Furthermore, interviews focused on the development of DAP journalists and the qualities that signify both DAP journalists and leading DAP journalist organizations.
Snowball sampling was used to recruit additional interviewees; each interviewee was asked to nominate additional subjects.

In total, 20 interviews with professional journalists were conducted over a period of 10 months. The objective in selecting interview subjects was to recruit participants from a wide-array of news organizations. Interview subjects represented a range of news sectors including print, broadcast, and digital native news organizations. Legacy organizations such as The Wall Street Journal, as well as newer entrant organizations such as Vox were both included. Interview subjects also represented a range of organizational sizes from regional news organizations such as The Tampa Bay Times to larger news organizations with international operations such as Bloomberg.

Journalist titles varied substantially across interview subjects and included references, for example, to apps, data, development, engagement, interactive, and visual journalism. The majority of interview subjects were at the level of editor or manager.

Approximately half of the interview subjects came from a traditional educational background in journalism; other educational backgrounds ranged from art and design to computer science and physics. Table 3-2 provides a list of interview subjects along with corresponding organizations and positions, as well as interview date.

The interview script is provided in Appendix A. All interviews were recorded, transcribed, and aggregated into a database for coding. Initial interviewees were strategically identified based on a wide network of professional contacts; subsequent subjects were identified based on recommendations from the initial interviews, which enabled a snowball sampling process.
On average, interviews lasted 30 minutes. Interview subjects were initially contacted via email. Interviews were conducted and recorded mostly via VOIP or mobile phone. Subjects were not offered compensation, but were offered the option of anonymity. Identifying information is provided if a participant waived the right to anonymity.
<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Organization</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anonymous A</td>
<td>Mobile Editor</td>
<td>Digital native news organization</td>
<td>October 7, 2016</td>
</tr>
<tr>
<td>Anonymous B</td>
<td>News Editor</td>
<td>Digital native news organization</td>
<td>October 7, 2016</td>
</tr>
<tr>
<td>Anonymous C</td>
<td>Visual Journalist</td>
<td>Print news organization</td>
<td>April 24, 2017</td>
</tr>
<tr>
<td>Sarah Slobin</td>
<td>Things Editor</td>
<td>Quartz</td>
<td>May 22, 2017</td>
</tr>
<tr>
<td>Meredith Broussard</td>
<td>Assistant Professor, Arthur L. Carter Journalism</td>
<td>New York University</td>
<td>May 23, 2017</td>
</tr>
<tr>
<td>Erin Medley</td>
<td>Director, Editorial and Audience Development</td>
<td>TVGM Holdings</td>
<td>June 1, 2017</td>
</tr>
<tr>
<td>Rachel Schallom</td>
<td>Project Manager</td>
<td>The Wall Street Journal</td>
<td>June 1, 2017</td>
</tr>
<tr>
<td>Anonymous D</td>
<td>Journalist</td>
<td>Independent</td>
<td>June 2, 2017</td>
</tr>
<tr>
<td>Brian Boyer</td>
<td>Head of Product of Operations</td>
<td>Spirited Media</td>
<td>June 5, 2017</td>
</tr>
<tr>
<td>Elaine Piniat</td>
<td>Audience Engagement Editor</td>
<td>Newsday Media Group</td>
<td>June 9, 2017</td>
</tr>
<tr>
<td>David Eads</td>
<td>News Applications Developer</td>
<td>ProPublica</td>
<td>June 13, 2017</td>
</tr>
<tr>
<td>Courtney (CJ)</td>
<td>Data Graphics Producer</td>
<td>Star Tribune</td>
<td>June 13, 2017</td>
</tr>
<tr>
<td>Julia Wolfe</td>
<td>Visual Journalist</td>
<td>FiveThirtyEight</td>
<td>June 16, 2017</td>
</tr>
<tr>
<td>Madi Alexander</td>
<td>Data Journalism Reporter</td>
<td>Bloomberg BNA</td>
<td>June 29, 2017</td>
</tr>
<tr>
<td>Adam Playford</td>
<td>Investigations Editor</td>
<td>Tampa Bay Times</td>
<td>July 2, 2017</td>
</tr>
<tr>
<td>Sisi Wei</td>
<td>Deputy Editor of News Applications</td>
<td>ProPublica</td>
<td>July 6, 2017</td>
</tr>
<tr>
<td>Alvin Chang</td>
<td>Senior Graphics Reporter</td>
<td>Vox</td>
<td>July 10, 2017</td>
</tr>
<tr>
<td>Anonymous E</td>
<td>Interactive News Engineer</td>
<td>Print news organization</td>
<td>July 12, 2017</td>
</tr>
<tr>
<td>Anonymous F</td>
<td>Design Editor</td>
<td>Print news organization</td>
<td>July 14, 2017</td>
</tr>
<tr>
<td>Anonymous G</td>
<td>VP of Product</td>
<td>Broadcast news organization</td>
<td>July 17, 2017</td>
</tr>
</tbody>
</table>
Trade press coverage. To gain a better sense of rapid institutional change in the journalist profession at the industry level, relevant articles from trade publications and industry documents were collected, reviewed, and analyzed. Archival industry materials are indeed an appropriate method for examining institutional change at the industry level (Kieser, 1994). Specifically, trade publications and industry documents are often used as a data source to analyze media industry transformation (Astroff, 1988; Kosterich & Napoli, 2016) and they provide a window into the developments and dynamics necessary for conducting institutional analyses (Betrand & Hughes, 2005). Building upon earlier work examining trade press coverage of the journalism and news industry (Meltzer, 2015; Powers, 2012), articles were drawn from the websites of Columbia Journalism Review (CJR), Digiday, Nieman Journalism Lab, and Poynter Online.

Web archives were searched at each of these publications for articles that referenced one or more of the following keywords “data,” “developer,” “application,” “analytics,” “programmer,” “platform,” “engagement,” “interactive,” “graphics,” or “visual” co-occurring with “journalist,” “journalism,” “editor,” or “team.” The selection of search terms was guided by discussions with the interview subjects. The goal was to collect relevant documents with a focus on new or changing jobs, skills, roles, or expertise in the journalist profession. Coverage was limited to articles published during the examined period of rapid change (2011 - 2016).

References to materials not included in the original sample were also collected. This led to a number of memos and reports from news organizations themselves, including both legacy news organizations and digital native news organizations. In sum, the dataset contains a total of 280 articles. In addition to the actual text of each article, a
record was maintained to track the number of articles covering each of the 15 NYC news organizations in the case study (as described below in the employment histories subsection) each year from 2011 through 2016. A full list of publication sources and article counts is provided in Table 3-3.

Table 3-3

List of Publications

<table>
<thead>
<tr>
<th>Publication Source</th>
<th>Number of Articles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Columbia Journalism Review</td>
<td>37</td>
</tr>
<tr>
<td>Digiday</td>
<td>58</td>
</tr>
<tr>
<td>Nieman Journalism Lab</td>
<td>85</td>
</tr>
<tr>
<td>Poynter Online</td>
<td>65</td>
</tr>
<tr>
<td>Various industry documents</td>
<td>35</td>
</tr>
<tr>
<td>Total</td>
<td>280</td>
</tr>
</tbody>
</table>

**Participant observations.** Over the past three years, I attended a number of industry events that focused on the topic of recent transformation in news. These events included, for example, the Journalism and Silicon Valley conference (November, 2015), the World Media Economics and Management conference (May, 2016), and the Future of Augmented Journalism (May, 2017). This combination of workshops and conferences provided useful arenas through which to conduct participant observation of professional journalists and industry change and helps add context to this research.

**Employment histories.** A sample set of news organizations was created as a representative case study of professional journalist employment histories. Analysis was restricted to news organizations headquartered in NYC. The NYC context provides a test bed for examining ongoing change related to professional journalists due to the diversity of organizations in NYC, the size of the media market, and the interaction of news organizations with other collocated industries (Kosterich & Weber, in press).
The sample set of news organizations was generated using CisionPoint, which is a global commercial media database with over 1.6 million records (cision.com) considered to be representative of the journalist population (Nel, 2010) and previously utilized in research examining professional journalists (Gulyas, 2013; Lewis & Zhong, 2013). CisionPoint allows for the search and filtering of news organizations by a variety of input variables. A search for U.S. newspapers, television networks, and websites headquartered in the NYC area that covered news and published on a daily and/or continuous basis resulted in a sample list of 15 organizations that also have a company profile page on professional networking site LinkedIn. Published lists are often used as a viable sampling frame when it is not possible to get an accurate count of the total population (Ornebring & Mellado, in press; Richie, Lewis, & Elam, 2003).

The 15 focal organizations are: ABC News, Buzzfeed, CBS News, Daily Beast, Fox News, The Huffington Post, Mic, MSNBC, NBC News, The New York Daily News, The New York Times, NowThis, Patch, Slate, and The Wall Street Journal. These companies all perform important news functions, but they are not all traditional, legacy newspaper companies. Some of the organizations included in this sample are primarily print news organizations, others produce broadcast news, and some are digital native news organizations. In aggregate, this sample represents a cross section of news sectors and organizations providing news in the NYC area.

Information on professional journalists and employment histories of individuals working for the sample news organizations were created by aggregating public data sources such as Pew Research Center’s State of the News Media, the American Society for News Editors Newsroom Employment Census, and LinkedIn, a professional
A networking site with 500 million global users (Awan, 2017) that contains information about a substantial portion of the U.S. workforce (Horton & Tambe, 2015). Employment histories on LinkedIn contain information about labor markets and professional workforces such as prior employers, job roles, skills, and education (Tambe, 2014). Prior research has utilized LinkedIn data to examine the technological professionalization of political campaign workforces (Kreiss, in press) as well as to analyze the robustness of the information on workforce mobility as compared to patent information (Ge, Huang, & Png, 2016). In fact, Ge et al. (2016) found that LinkedIn was a more reliable source of career histories than patent tracking, with a 90% accuracy rate as compared to 70%.

A search was conducted for each of the organizations in the dataset and employee histories were recorded manually in a separate database. Data collection for the employment histories began in February 2016 and concluded in July 2016.\(^5\) Position job titles, organizations, and dates of employment were collected for the employment histories of each employee at the sample news organizations.\(^6\) Educational information including undergraduate degree and graduate degree (when applicable) was also collected for each employee. Immediately following completion of collection and recording, data were de-identified and anonymized.

At this point, organizations and positions in the dataset were categorically coded in order to summarize the data. Organizations were coded by industry and positions were coded by general function. Industry codes were assigned based on common mission as envisioned by a combination of the organization’s LinkedIn company page and corporate website. Position codes were created through an iterative process of code generation,\(^5\)

\(^5\) Four undergraduate research assistants helped with the collection of this information.
\(^6\) The overall data collection approach was validated by comparing numbers across data sources, which is provided in Appendix B.
undertaken by the researcher and verified through interviews with journalists. A list of codes is provided in Appendix C.

The position for each work history was coded to reflect the general function on two levels: first, to reflect general positions such as producer, reporter, writer, editor, etc. and second, to further understanding of the development of DAP journalist jobs across the news industry. Thus, newsroom job titles were also assigned one of two codes: traditional or DAP. The traditional category encompasses both traditional and online editorial, reporter, and support positions within the newsroom such as editor, journalist, producer, and writer. The DAP category reflects those technological developments that came after the transition from print to online news, which became specifically evident through the interview process and include the rise of big data, audience engagement metrics, application programming and software development, and social and mobile platforms. DAP positions include, for example, data journalist, engagement editor, and news applications developer. This general coding scheme was further verified through multiple interviews with professional journalists.

**Job listings.** To gain a better sense of change in journalist positions from 2011 through 2016, job advertisements were collected and analyzed. Job advertisements are textual representations of industry labor markets (Rafaeli & Oliver, 1998), especially useful as indicators of change (Zhou, 1996). Job advertisements have been used in earlier research aimed at understanding changing job positions and skillsets in the news industry (Massey, 2010). A leading database of journalism jobs was acquired. The database provides seven years of data (2010-2016) and includes approximately 8,000 listings of

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7 As part of the data sharing agreement, identifying information from the job database has been kept confidential.
journalism job openings. Each listing includes a time stamp, job title, employer, and job description. The listings were also further coded to reflect traditional versus DAP journalist positions according to the established coding scheme utilized on the employment histories and verified by professional journalists.

Organizational research databases. Additional data including company founding date and revenue of the 15 focal news organizations were collected from two databases: PrivCo and MarketLine. PrivCo is a database that tracks private organizations and thus was used for information on those organizations in the sample that are privately owned. MarketLine is a business information database for public companies, and was thus used to collect information on those organizations in the sample that are publically owned. The Rutgers University library provided access to both databases.

Disruption and Institutional Change in the Journalist Profession

The first component of the research design seeks to model a process of how institutional change occurs in a rapid time frame, specifically as compared to the traditional model of institutional change (RQ1 and RQ2). This process is explored through the case of the journalist profession. To do so, a qualitative analysis was conducted in parallel on both the interview data and the archival industry press data in order to provide a contextualization of institutional change with regard to professional journalists. Data from the participant observations of workshops and conferences were also used to confirm interpretation of events and further reliability (Jick, 1979). In this way, data attend to both internal and external (organizational) material. In other words, interviews were conducted with professional journalists and articles were written by and an external, public audience.
All interview transcripts, trade press articles, and industry reports were uploaded into NVivo, a qualitative software program (Nvivo for Windows, 2012). NVivo facilitates the organization of texts for close reading, detailed note taking, and coding and is thus utilized in qualitative analysis of text materials (Reay et al., 2017). Together, these documents formed a dataset that was read and coded iteratively according to both data and theory with the goal of identifying emergent themes and meaningful theoretical dimensions (Gioia, Corley, & Hamilton, 2013) to contextualize the institutional change process related to professional journalists.

The analysis was conducted in two stages. First, a strategic narrative approach (Stryker, 1996) was used to analyze change in professional journalists and the development of DAP journalists from 2011 through 2016. Data were first organized chronologically, generating a sequence of events and coherent narrative. Of particular interest was the development of DAP journalists as related to traditional journalists, as well as both internal and external response to this new form of professional journalists. An historical narrative was assembled once no new evidence emerged from the data (Micelotta, 2015). The narrative summarized the key events and key players related to professional journalists and change. This approach enabled a reconstruction and contextualization of events related to the development of DAP journalists as a new form of professional journalists, as well as to the more general process of rapid institutional change in the news industry.

Next, a grounded theory approach (Corbin & Strauss, 1990) was employed to look for emergent themes that were guided by theory on institutional change. A grounded theory approach emphasizes constant comparative analysis of the data, which is a method
of joint coding and analysis in an effort to generate general categories (Glaser & Strauss, 1867). The collection of interviews and archival materials lends itself to grounded theory analysis, which is designed to elucidate understandings from the data by systematically going through the documents, allowing categories to emerge and ensuring each is grounded in the qualitative data (Tracy, 2013).

Texts were categorized according to the Greenwood et al. (2002) six-stage model, which allowed for a theoretical contextualization of if and how rapid change in the journalist profession adheres to a process of institutional change. For example, text from a 2012 article in CJR discussing the opportunities for innovation related to data expertise in the news industry tending to come from outside the field (Bell, 2012) was tagged as “change from outside” and categorized as an example of the deinstitutionalization stage. As another illustration, text from a 2016 Nieman Journalism Lab article on the revenue, grant, and award successes of ProPublica’s news applications team (Klein, 2016) was tagged as “legitimization” and thus an example of the theorization stage of institutional change.

The findings from the first research component are structured and presented according to the stages of institutional change. They provide an industry level contextualization of rapid institutional change and the development of DAP journalists as a new form of professional journalists. Furthermore, they address the first analytical task, which is to further understanding of the process and outcomes of institutional change when it occurs within a rapid time frame. The findings for this research component are presented in Chapter 4.
Employment Networks of Professional Journalists

The second analytic task is to understand the composition of the journalist profession over time (RQ3), specifically with regard to the development of DAP journalists and as compared to traditional journalists. To do this, a case study of public employment histories (as explicated above) was collected to create an employment network of NYC area journalists from 2011 through 2015.\(^8\) An employment network lends itself to social network analysis (SNA), which is widely used in studying organizational change (Monge, Heiss, & Margolin, 2008) to examine the composition of a workforce over time, and the movement of professionals between different positions, organizations, and industries.

More specifically, SNA is a research method and theoretical approach that enables the examination of the connection between two entities based on a common relationship (Borgatti & Foster, 2003). In order to analyze the employment history data as network data, it was necessary to convert the information from a database format to a network format. Recall that each line of data in the employment database contains a unique identification number, job position, company, tenure, position code, and company industry code.

First, data were transformed into a two-mode affiliation network of the aggregated data from 2011 through 2015; later, sub-networks were created for each year. In network terminology, nodes are the vertices, and ties are the connections between those vertices. The two-mode network contains two types of vertices (e.g. journalists and

\(^8\) The case study of professional journalists in NYC is limited to 2011 through 2015 as that was the last complete year of available information at the time of data collection.
organizations). In this case, a ‘1’ was used to indicate that a journalist worked at a particular organization and a ‘0’ was used to indicate that no relationship existed.

Next, a one-mode network of organizations-by-organizations (i.e., one type of vertex) was created from the original two-mode affiliation network of journalists-by-organizations (i.e., two types of vertices). Network packages including Statnet (Handcock, Hunter, Butts, Goodreau, & Morris, 2008) and iGraph (Handcock et al., 2008) were used in the open source R framework (R-Core-Team, 2015) to conduct matrix multiplication and transform the two-mode network into the one-mode network of organizations. For example, in this one-mode network if Employee A works for The New York Times, and then in 2014 leaves The New York Times to go work for The Huffington Post, it would be possible to say that there is a relationship between The New York Times and The Huffington Post based on the movement of an employee from one company to the other.

While those networks provide insight into the evolution of the journalist profession as a whole, the second goal of this analytical task is to better understand DAP journalists as compared to traditional journalists. Thus, two sub-networks were generated: first, a network of only jobs coded as DAP and second, a network of only jobs coded as traditional. These networks were utilized to examine the organizational leaders and industry origins of DAP journalists as compared to traditional journalists.

While insight into the organizational leaders is gleaned from two-mode affiliation networks of journalists-by-organizations, insight into industry origins requires further network transformation. Here, one-mode networks were created to visualize the relationship between the current industry of each DAP job in the dataset and the industry
of the prior job for each current DAP journalist. For example, if Employee A is currently in a DAP position in digital native news, and had a previous position in technology, it would be possible to say that there is a relationship between digital native news and technology based on the movement of a DAP workers from one industry to the other. This industry network was examined for DAP to DAP transitions and then compared to traditional to DAP transitions.

A variety of network measures and visualizations were generated on for these networks. The iGraph package (Handcock et al., 2008) was used in the open source R framework (R-Core-Team, 2015) to conduct standard network analysis measures including degree centrality and betweenness centrality, which are described next in more detail. Gephi, an open source network exploration and visualization tool (Bastian, Heymann, & Jacomy, 2009) was used for network visualization.

**Degree centrality.** Degree centrality is the number of connections that a node has with other nodes within the network. This measure is used to indicate a node’s popularity or activity within the network (Wasserman & Faust, 1994). The number of connections provides a good proxy for the level of importance in a network (Cherven, 2015). Degree centrality provides an indication of which organizations are most important within a network. This test was conducted on the full network of professional journalists, the DAP journalist network, and the traditional journalist network.

Furthermore, in directed networks (as opposed to undirected networks), it is possible to measure both in-degree (the number of incoming ties) and out-degree (the number of outgoing ties) centrality. Out-degree measures were thus performed on the industry networks for both DAP to DAP jobs, and traditional to DAP jobs. All degree
centrality measures were calculated with the degree routines in iGraph (see, Ognyanova, 2016).

**Betweenness centrality.** Betweenness centrality measures a specific version of importance within a network; in this case, it represents the extent to which a node (e.g. organization) serves as a bridge between other nodes within the network (Cherven, 2015). Thus, betweenness centrality can serve as a signal of an organization’s influence (Freeman, 1979) or control over the network flow. In other words, a high betweenness centrality indicates that an organization was one through which a large number of journalists passed during the course of their careers. Betweenness centrality was calculated with the iGraph routine for betweenness centrality (see, Ognyanova, 2016) and provides further insight into the overall professional journalist network by highlighting those organizations most likely to bridge employee company transitions.

Together with descriptive statistics, these measures were used to examine the employment network of professional journalists over time from 2011 through 2015; in doing so, they address the third research question. Furthermore, the findings from this research component provide insight into the development of DAP journalists as compared to traditional journalists and provide network measures utilized in the third analytical task (discussed in detail in the following subsection). The findings for this research component are presented in Chapter 5.

**DAP Journalists and DAP News Organizations**

The third analytical task was to further understanding of rapid institutional change at both the actor level (i.e., journalists) and the organizational level. In other words, the goal is to identify those factors that contribute to the likelihood of individuals being DAP
journalists and the likelihood of organizations being leaders in DAP news. This effort is specifically aimed at testing H1-H6, which together further a multi-level understanding of the factors that statistically significantly increase the probability of rapid institutional change of DAP.

To accomplish this task, two sets of analyses were conducted. The first analysis tests actor-level rapid institutional change and the factors that contribute to the likelihood of a journalist being a DAP journalist. Actor-level rapid institutional change is examined in the analysis of H1 and H5.

Hypothesis one proposed that rapid institutional change is positively associated with moral legitimacy. In the case of the journalist profession and DAP journalists, moral legitimacy occurred, for example, through the incorporation of DAP related courses in journalism education programs (as is discussed in Chapter 4). Thus, an undergraduate degree in journalism and/or a graduate degree in journalism signals moral legitimacy. Hypothesis five proposed that as rapid institutional change progresses, it is driven from within the industry. This is represented by employment experience in the news industry immediately prior to a DAP journalist job.

Regarding H1 and H5—rapid institutional change at the actor level—a binomial logistic regression was used to test the likelihood that a journalist is a specific kind of journalist (i.e., DAP journalist or traditional journalist) from a combination of education and employment experience variables, which are discussed below in further detail. A binomial logistic regression is well established as the most appropriate strategy for predicting a dichotomous and categorical outcome variable (e.g. DAP journalist or not)
from a set of independent variables (Leech, Barrett, & Morgan, 2011). The baseline model is as follows:

\[ P(Y) = \frac{1}{1 + e^{-(b_0 + b_1x_1)}} \]

where \( Y \) represents the probability of a DAP journalist and predicted by \( X_1 \), which is the combination of all experience variables.

Two models were constructed to fully assess the impact of moral legitimacy (journalism education) and industry (employment experience) variables on current journalists. The first regression used current DAP journalist as the independent variable and the second used current traditional journalist as the independent variable. The combination of regressions allowed for assessment and comparison of the impact of moral legitimacy and industry experience on two different forms of professional journalists.

Data were collected and organized to reflect the educational degree (undergraduate major), graduate education (graduate degree), years as a professional (number of years since graduation), prior industry experience (industry of the job immediately preceding the current news job), diversity of prior industry experience (the number of unique industries in which each journalist had jobs), and the ratio of DAP jobs to total jobs for each current journalist. In general, these variables reflect the factors that interview participants and the literature suggest likely contribute to rapid institutional change in DAP journalists. More specifically, they provide the opportunity to test the relationship between moral legitimacy (journalism education) and industry (employment experience in the news industry versus outside the news industry) and rapid institutional change in professional journalists.
The sample population consists of all current journalists in the employment history dataset (N = 3,587 current journalists). Data from the employment history dataset were collected and coded to reflect a variety of variables. These variables are detailed in the following subsections.

**Dependent variable I – DAP journalist.** The dependent variable for the first binomial logistic regression is a dichotomous code reflecting employment in DAP. Journalists were coded as “1” if the current position was DAP and “0” if it was non-DAP. There are 150 current DAP journalists in the dataset.

**Dependent variable II – Traditional journalist.** The dependent variable for the second binomial logistic regression is a dichotomous code reflecting traditional journalist employment. Journalists were coded as “1” if the current position was traditional and “0” if it was non-traditional. There are 3,437 current traditional journalists in the dataset.

**Education.** The major (undergraduate degree) of each journalist was recorded and coded to reflect one of 11 categories. Coding of these majors was guided by the categories of the National Center for Education Statistics (https://nces.ed.gov/). The full list of education codes is provided in Appendix D. In order to test the education variable in a binomial logistic regression, it was transformed into 11 separate dummy variables within the SPSS program (IBM Corp, 2013).

**Graduate education.** Graduate education was utilized as a dichotomous variable. Journalists without a graduate degree were coded as “0.” Journalists with a graduate degree were coded as “1.”

**Graduate education in journalism.** Graduate education, specifically in a journalism program was also utilized as a dichotomous variable. Journalists without a
graduate degree in journalism were coded as “0.” Journalists with a graduate degree in journalism were coded as “1.”

**Years in industry.** The number of years since undergraduate graduation was subtracted from the current year (2017). If no graduation year was listed, the start year of the first recorded job was used in the calculation. Years in industry ranged from 1 to 65 ($M = 10.18$, $SD = 8.90$).

**Prior industry.** The industry of the job prior to the current journalist job was recorded based on the industry coding of the employment history dataset outlined in chapter three. Six prior industries were present in the dataset including broadcast news, digital news, print news, entertainment, publishing, and technology. In order to test the prior industry variable in a binomial logistic regression, it was transformed into six separate dummy variables within the SPSS program (IBM Corp, 2013).

**Industry diversity.** The number of unique industries in the employment history for each journalist was recorded. Industry diversity ranged from 1 to 6 ($M = 1.05$, $SD = 0.76$).

**DAP jobs to total jobs.** Lastly, this variable measures the ratio of DAP jobs to total jobs for each journalist. As a ratio, the range was 0 to 1 ($M = 0.36$, $SD = 0.15$).

In order to conduct the binomial logistic regression, all data were collected and tracked in an Excel spreadsheet, which was then imported into the Statistical Package for Social Sciences (SPSS) Version 22 for analysis (IBM Corp, 2013). Correlations were examined prior to running the regression and multicollinearity assumptions were met. In
addition, goodness of fit measures (e.g., Nagelkerke’s pseudo $R^2$) were used to validate the results of the regression. The results of this analysis are discussed in Chapter 6.\footnote{An alternative model is also presented in Appendix E.}

The second analysis tests organizational-level rapid institutional change and the factors that contribute to the likelihood a news organization being a leader in DAP news. Organizational-level rapid institutional change is examined with H2, H3, H4, and H6. Respectively, these hypotheses proposed that rapid institutional change is positively associated with pragmatic legitimacy, negatively associated with age and size, and positively associated with cognitive legitimacy.

Regarding rapid institutional change at the organizational level (H2, H3, H4, H6), a multiple linear regression was used to test the relationship between leadership in DAP news and pragmatic legitimacy, age, size, and cognitively legitimacy, respectively. Each of these is discussed below in further detail. A multiple linear regression is well established as an appropriate analytical tool for the general purpose of predicting a dependent variable from several other independent and control variables (Leech et al., 2011) as it also allows for control of effects from each predictor variable (Lowrey, Parrott, & Meade, 2011). The baseline model is as follows:

$$y_i = \beta_0 + \beta_1 X_{i1} + \beta_2 X_{i2} + \ldots + \beta_k X_{ik} + \varepsilon_i$$

where $y_i$ represents organizational leadership in DAP news and there are $k$ (in this case, 5) input variables, which are each associated with a regression coefficient $\beta$ (Campbell, 2006).

Two models were again constructed to fully explore the factors that contribute to rapid institutional change at the organizational level (e.g. leadership in DAP news).
Organizational leadership in DAP news was measured with degree centrality in the DAP news network (Model III) and was then compared to the results for degree centrality within the traditional news network (Model IV). The sample population consists of the 15 NYC area news organizations (N = 15). All variables are explained in the following subsections.

**Dependent variable I - Degree centrality within the DAP news network.**
Degree centralities for each of the 15 sample news organizations within the network of DAP news organizations were measured and recorded (as discussed earlier in this chapter and as presented in Chapter 5). These measures were calculated for the aggregated networks over time, and were normalized to allow for comparison.

**Dependent variable II - Degree centrality within the traditional news network.** Degree centralities for each of the 15 sample news organizations within the network of traditional news organizations were also measured and recorded. These measures were calculated for the aggregated networks over time, and were normalized to allow for comparison.

**Pragmatic legitimacy.** Pragmatic legitimacy was measured as the number of DAP journalist positions under each organization in the job listings dataset. Recall from Chapter 2 that pragmatic legitimacy involves the linking of something new with economic outcomes. In the case of the journalist profession, pragmatic legitimacy of DAP journalists is signaled, for example, through the dedication of resources and finances to DAP journalist job positions. For each organization, the number of DAP journalist positions was then divided by the total number of positions in the dataset in an effort to normalize the measure.
**Age.** Founding dates for each organization were collected using information from the PrivCo database (for private organizations) and the MarketLine database (for public organizations). A variable was created for organizational age that measures years in operation by subtracting the founding date from 2017.

**Size.** Organizational size was measured by the number of journalists for each organization as listed in the CisionPoint database.

**Cognitive legitimacy.** Cognitive legitimacy was measured as the number of articles for each organization in the trade press dataset (recall this dataset is comprised of DAP-related articles). Press coverage is an indicator for organizational legitimacy (Bitektine, 2011; Kennedy, 2008; Weber, Fulk, & Monge, 2016) as it increases public knowledge and awareness (Hannan & Freeman, 1986). This is true specifically in the case of the news industry in which authority, power, and control are derived from external perceptions of legitimacy (Hanitzsch & Vos, 2017). In addition, a search was conducted for the total number of articles mentioning each organization in all four of the main publication sources (CJR, Digiday, Nieman Lab, and Poynter). For each organization, the number of articles in the (DAP) trade press dataset was then divided by the total number of articles in the main publication sources to garner comparable measures of DAP related legitimacy.

**Control variables – Revenue.** Utilizing information from PrivCo (for private organizations) and MarketLine (for public organizations), 2016 revenues for each organization were collected and recorded.

In order to conduct the multiple linear regression, all data were collected and tracked in an Excel spreadsheet, which was then imported into the Statistical Package for
Social Sciences (SPSS) Version 22 for analysis (IBM Corp, 2013). Correlations were examined prior to running the regression and goodness of fit measures (ANOVA) were used to validate the results of the regression. The results of this analysis are provided in Chapter 6.

The quantitative statistical analyses used in this third research component are supplemented with further findings from the qualitative analysis of interviews with professional journalists. Together, these results provide integrated insight into the factors that contribute to the likelihood that an individual is a DAP journalists and an organization is a leader in DAP news, thus shedding light on rapid institutional change at both the actor level and the organizational level. In doing so, the results also address H1-H6; they are presented in Chapter 6.
Chapter 4:
Disruption and Institutional Change in the Journalist Profession

This chapter presents the findings of the first component of the research design. In doing so, it provides answers to RQ1 and RQ2, which examine the process of rapid institutional change, and specifically as compared to the established model of institutional change. These theoretical questions are explored through the case of the journalist profession from 2011 through 2016.

The analysis builds on Greenwood et al.’s (2002) model of institutional change to contextualize the rapid development of DAP journalists. As this chapter illustrates, the model generally accommodates the rapid change thus far observed from the analysis of trade press coverage and interviews. Two significant exceptions are noted: an alternative outcome aside from the traditionally theorized institutionalization or failure, and the stability of cognitive legitimacy without full diffusion or reinstitutionalization. The implications of the alternative model and outcome of rapid institutional change are further discussed in Chapter 7.

Precipitating Jolts: Destabilization of Established News Industry Practices

Institutional change begins when jolts emanating from social, technological, or regulatory changes disrupt stabilized industries (Greenwood et al., 2002). Recent technological advancements such as the growing ubiquity of the Internet, cloud computing, and mobile and social platforms continue to influence the rise and spread of digitalization and connectivity (Howard, 2014). Technological changes coupled with associated economic realities and social changes such as those related to news
consumption behaviors, have jolted the established practices of the news industry and thus the status quo regarding what it means to be a professional journalist.

**Economic realities.** While the news industry has long dealt with changes in technology (e.g. the introduction of radio in the 1920s and television in the 1950s), newspaper readership and revenues tended to remain largely stable (Barthel, 2017). It wasn’t until the late 1990s that core business models of newspapers began to change as news organizations began experimenting with content uniquely developed for online distribution (Grueskin, Seave, & Graves, 2011). In 1990, total daily newspaper circulation was 62.3 million; however, since 2011, total daily newspaper circulation has fallen by about 22% from 44.4 million to an estimated 34.7 million in 2016 (Barthel, 2017). Revenue, on the other hand, remained relatively steady through 2011—mostly due to a bubble in advertising revenue during the first decades of the Internet and the rise of online news, despite a decrease in audience revenue (Grueskin et al., 2011). Since 2011, however, total revenue (advertising and audience) for U.S. newspapers has since decreased by about 21% from $37.1 million to an estimated $29.2 million in 2016 (Barthel, 2017).

The numbers are not much better for professional journalists with regards to employment trends. According to the Bureau of Labor Statistics’ Occupational Employment Statistics (OES), there was an 18% decrease—a loss of 8,850 jobs—in full-time reporters or editors in the newspaper industry between 2011 and 2015, which is the last year with available data (Barthel, 2017). Newspapers lost over one quarter of their total employees (approximately 26%) between 2011 and 2016, while employment in Internet publishing increased 96% during that same period of time (Bureau of Labor
Statistics at US Department of Labor, 2017). Figure 4-1 provides an overview of recent employment change in both newspaper and Internet publishing as reported by Bureau of Labor Statistics at US Department of Labor (2017). In sum, total revenues are down and the exclusivity of the journalist profession is challenged.

Figure 4-1

Number of Employees in Newspaper and Internet Publishing (2011-2016)

Technological developments. It is important to note that professional journalists have been experimenting with technology for a long time. In 1952, CBS News used a Universal Automatic Computer (UNIVAC) to analyze election returns against past results and forecast Dwight D. Eisenhower as victor in the presidential election (Uberti, 2014). Further advances in computing fostered journalist adoption of technology that created the opportunity for data integration into news production processes (Howard, 2014). Shortly after that, journalist Philip Meyer published his landmark social scientific analysis of
quantitative data to tell the story of the 1967 Detroit riots, pioneering a movement known as Precision Journalism (Bell, 2015b).

Similarly, professional journalists have used data in their stories since the early days of reporting and have worked with databases and algorithms since the late 1960s, specifically as part of computer-assisted reporting (Howard, 2014). Since then, however, the growing ubiquity of digital technologies and data sources furthered the rise of “Big Data” and the “streaming, structuring, and storing of this information in reusable formats,” which “is increasingly the raw material of journalism” (Bell, 2012, p. 1). The coupling of this data with rapid computational advances facilitates and enables the analysis and visualization of public life in unforeseen quantities and detail (Codrea-Rado, 2012). The impact of these jolts is increasingly evident throughout the news industry as professional journalists are required to develop new skills to tell stories and engage with readers in new ways (Bell, 2015b). Business models are changing to reflect the ways in which data can be utilized as a “raw material for profit, impact, and insight, co-created with an audience that was formerly reduced to passive consumption” (Howard, 2014, p. ii).

The rapid proliferation of big data and advances in computing technologies represent only part of the disruptive process affecting the news industry. Perhaps even more important is the growing influence of social media platforms such as Facebook, Snapchat, Google and Twitter. It is important to note, however, that journalists grappled with online platforms (e.g. Geocities) decades prior to the advent of Facebook and Twitter (Peters, 2012). In contrast, today’s platforms have evolved past their role as
community forums and distributors to gatekeepers and mediators of the content that audiences see.

Third-party platforms often use algorithms, software, and other mechanisms to bring news content to consumers, acting neither as “neutral pipes, nor full media companies” but instead as “gatekeepers, controlling information flows, selecting, sorting, and then distributing information” (Foster, 2012, p. 6). These organizations are commercial companies with values that don’t necessarily align traditional foundations of the western notion of free press. The absence of public knowledge regarding what happens during the process between the creation of news and the consumption of news raises broader issues for democracy (Bell, 2015a).

Indeed, the means by which these platforms operate are economically sensitive, proprietary, and generally opaque. News organizations continue to cede control of publishing as a core activity and push content to these third-party platforms without guarantee of economic benefits (Bell et al., 2017). These changes have a profound impact on the news industry and professional journalists as control of distribution, user access to news, and editorial judgment shifts to platforms that yield an increasing amount of power over the news ecosystem.

Facebook’s valuation (market capitalization) - currently $446 billion (YCharts, 2017a) – provides a hint at the economics of the relationship between news organizations and third-party platforms. Compare that to the valuation of The New York Times, which is just under $3 billion (YCharts, 2017b). These market capitalizations are simply one indicator of growth in social media platforms as compared to the news industry. According to Bell et al. (2017), the development of social media platforms has a greater
effect on the US news industry than the development of the Internet, forcing news organizations to reevaluate traditional business models, production processes, and organizational structures.

**Social changes.** Along with technological developments related to mobile and social platforms come social developments regarding the ways in which audiences find and consume news. Indeed, news consumption is increasingly mediated, delivered, and curated by third-party platform companies on mobile devices. According to this year’s *Reuters Institute Digital News Report*, 59% of those sampled in the US used a smartphone to access news in the last week—up from 35% in 2013 (Newman et al., 2017). Coupled with this growth in mobile consumption is the growth in social media for accessing news. The report also found that more than half (51%) of those sampled in the US get news via social media—double the amount in 2013 (Newman et al., 2017).

Audience fragmentation exists across a growing range of distribution and publishing platforms. While news consumers have increased access in terms of their choice of news outlets and the speed with which they access news (Grueskin et al., 2011), news organizations struggle with the fact that consumers access content not only through traditional distribution (e.g. organizational products such as print newspaper, online news website, television program, etc.) but also via third party platforms and aggregators. Such circumstances led to efforts to evolve in order to meet the demands of a “digital-savvy consumer base who require information being presented in unique, digestible and sharable ways” (Thomas, 2011, p. 1) and as such, so too do the professional journalists who produce it.
Finally, an analysis of the recent jolts and disruption within the news industry is insufficient without a discussion of trust. As the number of people who consume news on social media platforms increases, so too does the number of people who distrust that news. For example, only 4% of web-using U.S. adults trust the information they get from social media “a lot” (Mitchell et al., 2016). Similarly, a recent survey from BuzzFeed and Ipsos Public Affairs sampled 3,000 U.S. adults and found that over half trust the news they read on Facebook “only a little” or “not at all” (Bilton, 2017).

Decline in trust of news goes further than those consuming news on social media platforms. In general only 18% of U.S. adults trust the information they get from national news organizations “a lot” and 22% trust the information they get from local news organizations “a lot” (Mitchell et al., 2016). Reflecting similar sentiments, a *Reuters Institute Digital News Report* found that 38% of U.S. respondents “trust most news most of the time” (Newman et al., 2017).

In sum, these jolts destabilize the established practices of the professional news industry. Indeed, lack of trust in the institution of U.S. news, combined with economic realities, technological developments, and social changes in the ways people find and consume continue to substantially disrupt the industry and established practices of professional journalists. The changing realities of the news industry require organizations to reevaluate traditional news processes and practices, and in particular, those regarding the roles and responsibilities of professional journalists (Moses, 2014).

**Deinstitutionalization and The Entrance of New Players**

Early efforts to adapt to digital disruption by the news industry were generally unable to keep pace with changes in technology and associated news consumption
behaviors (Petre, 2015). In fact, many of the changes that undermined traditional news processes and practices actually served as disruptive shocks creating an opportunity space for alternative approaches and the emergence of new players. The introduction of the iPhone (in 2007) and increased availability of Internet access, for example, facilitated an anytime, anywhere media environment that set the stage for a surge in the emergence of digital native news organizations catering specifically to those conditions (Bell et al., 2017).

**Emergent organizations.** Since 2011, the number of newspaper publishing companies in the US fell by 9% from 8,322 to 7,603 in 2016 (Bureau of Labor Statistics at US Department of Labor, 2017). Contrast that with the number of Internet publishing companies in the US, which grew by 54% from 8,692 in 2011 to 13,426 in 2016 (Bureau of Labor Statistics at US Department of Labor, 2017). The Pew Research Center conducted a census of the “Big 30” digital native news organizations (those responsible for the majority of employees at digital native news organizations) and found that over one third of them came into existence since 2011 and nearly all (25 organizations) emerged after 2000 (Mitchell & Page, 2014).

By definition, digital native news organizations emerge and develop entirely online, differentiating themselves from traditional news organizations in a variety of ways. Built on and for the Web, these organizations have technology at their cores with systems and professionals dedicated to data, analytics, engineering, and content management (Dixon, 2014). As such they are typically agile and willing to experiment with new technologies that could foster innovation, a flexibility that is further facilitated by the difference in distribution of costs from traditional news media companies.
Digital native news organization Vox, for example, was designed with a custom-built content management system particularly well-suited for innovation in data and interactive news (Morrison, 2014).

Furthermore, these digital native news organizations are typically capable of quickly meeting the requirements of digital news consumers who increasingly demand easily accessible, unique, and engaging forms of news and information. Digital native news organizations strive to innovate by creating new styles and forms of storytelling, hiring journalists with new skills for data visualization and audience engagement (Mitchell & Page, 2014). As early as 2012, The Huffington Post had an interactive news editor and a data scientist on staff (Benes, 2016). NowThis, a digital native news organization first launched in 2012, began with the mission of producing video for mobile and social platforms (O'Donovan, 2014b). Furthermore, these new entrants are inherently capable of benefitting from social media as a contributor to content creation, distribution, and engagement (Wu, 2016).

**Emergent funding.** Digital native news organizations continue to gain traction in the wake of disruption that marked the news industry since 2011. Reinforcing the need for innovation and new business models, venture capital funding proved critical to the growth of these emerging players. While venture capital funding is essentially a provision of necessary external resources, it is discussed here as an example of another new entrant—an emerging and alternative method of funding within the news industry.

Digital news native BuzzFeed, for example, received approximately $500 million in external funding between 2011 and 2016, including $400 million that came from NBC Universal as a corporate investor (PrivCo, 2017b). Since 2011, Business Insider and Mic
have each also raised approximately $50 million in venture capital funding (PrivCo, 2017a, 2017c). Globally, digital news and media companies raised $1622 million in funding in 2016, a 637% increase from $220 million in 2012, which was the first year for which data were available (CB Insights, 2017).

**Emergent actors.** Since 2011 and more generally, over the past decade, there has been a substantial increase in the number of new organizational entrants. Digital native news organizations emerged and introduced a number of innovations from outside the traditional boundaries of the news industry. New entrants, however, also came in at the actor level—in the form of new professionals bringing new knowledge, experience, and expertise into the news industry.

In 2008, the Medill School of Journalism at Northwestern University partnered with the John S. and James L. Knight Foundation to create a scholarship program aimed at bringing Web developers and programmers into news organizations to help solve problems and inspire innovation. The call for admissions to the program read:

> Are you a skilled programmer or Web developer? Are you interested in applying your talents to the challenge of creating a better-informed society? Do you want to learn how to find, analyze and present socially relevant information that engages media audiences? Do you see possibilities for applying technology as a way to connect people and information on the Web or new delivery platforms? If your answers are "yes," consider coming to Medill for a master's degree in journalism. You can earn your degree in just a year. You will learn new skills that will open doors to new opportunities that might help build a better democracy. And a new program at Medill offers you a chance to win a fully funded scholarship. (Journalism, 2007)

Brian Boyer, currently Head of Product Operations at Spirited Media, and Ryan Mark, currently Editorial Engineering Director at Vox, were awarded the first two scholarships. Neither of them had any journalism experience or even considered studying journalism. According to Boyer, he used to consider himself an outsider within the news
industry as he began his career as a software developer with a degree in computer science
and several years of professional experience building software for lawyers, banks, and
finance companies:

The work I was doing was work that left me unsatisfied. I liked the act of making,
leading creative teams, but at the end of the day…I didn’t feel like I was
contributing to society. And so right around that time of being disillusioned, I
happened upon an opportunity to study journalism – which I had never considered
as a career – at Northwestern…and it kind took a very fast career turn and I was
like okay let’s go to J-school. (Boyer, personal communication, June 5, 2017)

Upon completion of the one-year program at Northwestern, Boyer and Mark went on to
the Chicago Tribune and created the first news applications team in 2009. Many of the
founding members of this team came from similar backgrounds outside of news, joined
by a common interest in open data. As Boyer went on to explain about the early team:

What we had in common was an interest in open government and in open data…a
lot of the people that we hired at the beginning were converts. And that was a
matter of necessity. It wasn’t me saying I don’t want journalists, it’s just there was
a shortlist of people that we could have hired…it was The New York Times
interacts team and then a handful of people around… some could code, but
most were data nerds…We thought the Open Government was sort of the right, ya
know, it was an easy conversion to say, “hey data nerd, why don’t you do this
with a slightly different intent.” (Boyer, personal communication, June 5, 2017)

Since Boyer and Mark, 12 scholarship winners have graduated from the program
to go on and work in the news industry (Gordon, 2015). But this is just a handful of
emerging alternative professional journalists given the broader scope of the industry. The
news industry struggles to find journalists who have data and developer skills, as well as
the journalistic judgment necessary to produce successful and innovative news products
(Benton, 2012).

Three years after the inaugural class of Medill/Knight Fellows, another source
emerged bringing new players into the news industry from outside industries. In 2011,
Open News launched to form a network of developers, designers, journalists, and editors. The network also served as home to the Knight-Mozilla Fellowships, which took coders from outside of the news industry and placed them in newsrooms for 10 months (opennews.org).

According to Dan Sinker, the director of Open News, the goal was to “activate some hackers’ civic orientation to bring them into newsrooms, where they can reach a broad audience and help, in some small way, pull journalistic institutions closer to a digital orientation” (Benton, 2012, p. 2). Since its launch, hundreds of people have applied for the Knight-Mozilla Fellowship and a total of 33 individuals have gone on to receive the award (OpenNews, 2017). Indeed, the Knight-Mozilla Fellowship represents the entry of new professionals offering a fundamentally different approach to news production.

With the advent of the Web and the shift from print news to online news (1990s-early 2000s), the industry failed to recognize both the opportunities and obstacles of technological developments and the associated changes in consumption behaviors (Bell et al., 2017). Indeed, legacy news is often slow to evolve and laden with legacy business models, processes, and practices (Eads, personal communication, June 13, 2017). With this latest wave of transformation, however, there is an awareness that change must occur, even if it is destined to come from outside the field (Bell, 2012). Following the developments associated with deinstitutionalization and the publicity surrounding other journalists who came into the industry from outside the industry (e.g. Nate Silver, a statistician whose blog FiveThirtyEight was licensed by The New York Times in 2010 and is now owned by ESPN and ABC News), it seemed as though many more new
entrants would emerge to address the problems associated with the increasingly digital and networked media environment (Stray, 2012).

In the form of organizations, funding, and professionals, new players entered into the news industry from outside its traditional boundaries. These new entrants to the profession of journalism offer an alternative approach to the established practices and processes. As such, these new players ignite the possibility of change for professional journalists and thus represent deinstitutionalization, the second stage of institutional change.

**Preinstitutionalization: Exploration, Experimentation, and Evaluation**

In 2011, discussions emerged throughout the news industry discussing data and apps, and journalism as “more than just writers writing and editors editing” (Waite, 2011, p. 1). The growth in social media spurred exploration of careers for professional journalists, especially “tech-savvy young journalists” (Peters, 2012, p. 1). In addition, new collaborations between computer scientists and journalists continued to develop in the form of meetups and hackathons (Bell, 2012).

**Exploration.** For a sense of the state of DAP journalists at that time, Myers (2011) interviewed 20 professional DAP journalists at organizations including Chicago Tribune, ProPublica, Los Angeles Times, Des Moines Register, Providence Journal, Dallas Morning News, Talking Points Memo, and Texas Tribune. Some of these professionals were one of a team, but many were the only journalists of their kind in the newsroom. At digital native Talking Points Memo, for example, two newsroom developers created the innovative Election Night app in 2012. It was a standalone app
built specifically for election coverage that used data from the Associated Press to provide results to users.

In broadcast news, National Public Radio (NPR) hired a developer-journalist charged with bringing algorithms and data into news work, merging the fields of computer science and news in an effort to solve some of the industry’s problems (Bell, 2012). Wilson Andrews, Information Designer at the Washington Post, used data visualization techniques to meet the evolving demands of news consumers; in 2011, he won two Emmy awards for his Investigative Guns project and stated that it was only the beginning for more creative possibilities in news (Thomas, 2011). At WNYC, news director John Keefe began experimenting with data and code in 2009, an interest that eventually led to their 2012 NYPD stop-and-frisk investigation, the impact of which encouraged WNYC to pursue more DAP news (Oputu, 2014).

The New York Times’ *Snow Fall* is perhaps the most famous example of early experimentation with DAP journalists and DAP news production. *Snow Fall* told the story of an avalanche in Tunnel Creek, Washington, by integrating text with video, photos, and graphics. The storytelling package was an “evolution in online storytelling” that received almost 3 million visits and 3.5 million page views with as many as 22,000 users at any given time (Romenesko, 2012, p. 1). With a number of journalists including traditional journalists and data scientists, the New York Times was able to produce an innovative story integrating motion, graphics, data, video, and text in a way that felt seamless to the user. The feature won the Pulitzer Prize and was recognized for its “enhanced by its deft integration of multimedia elements” including extensive video, animation and graphics (Haughney, 2013, p. 2).
**Experimentation.** Experimentation is another important aspect of the preinstitutionalization stage, and is evident in the form of innovation labs and corporate partnerships. A handful of news companies started shifting their organizational structures in an effort to foster internal innovation, diversify revenue, and essentially, remain relevant (Polgreen, 2014). Take Curious City, a radio series at WBEZ focused on audience engagement that asks listeners to ask questions about Chicago (Wenzel, 2017). Since its launch in 2012 as an experiment in intrapreneurship, Curious City stories remain some of WBEZ’s most successful content (Polgreen, 2014).

Other pioneering examples include incubators and innovation labs launched at The New York Times (Weber, 2013), the Philadelphia News Network and Digital First Media (Ingram, 2012), and the Boston Globe (McKenzie, 2013). Not all of the projects were successful, and as expected, tension built between established processes and change. However, these experiments are examples of structural shifts toward incorporating data, visualization, and general interactive and engaging content into the production of news and the professionals who produce it (Polgreen, 2014).

**Evaluation.** Preinstitutionalization also represents the stage during which organizations begin to evaluate the utility of this new form of professional journalist. During this early stage of change (approximately 2011-2012), there were a number of different conferences and symposia devoted to various aspects related to DAP journalists. Industry associations such as the National Institute for Computer-Assisted Reporting (NICAR), the Online News Association (ONA), and the Society for Professional Journalists (SPJ) all held sessions at their annual conferences dedicated to discussion of topics related to DAP journalists.
NICAR, which is a subprogram of Investigative Reporters & Editors (IRE) in existence since 1989, has moved increasingly toward a mission of understanding how to use data and computing technology in producing news. The 2011 annual conference was described as “a creative collision of words and nerds” (Waite, 2011). Leaders in journalism, technology, and computation also came together at the Symposium on Computation and Journalism to discuss the role of computing technologies in the practice of journalism and the opportunities and challenges for professionals involved (Symposium on Computation + Journalism, 2008). Open News also launched a conference called SRCCON, the first event primarily dedicated to journalists who code, which further helped create a community and validate the work of DAP journalists (Schallom, personal communication, June 1, 2017).

Furthermore, in 2011, the annual ONA conference had five general sessions dedicated to DAP journalists including “Cooking Up Tasty Apps” and “Once Upon a Datum: Telling Visual Stories” (ONA, 2011). At the 2012 conference, data journalism was singled out as a key skill for professional journalists (Fincham, 2012). By 2016, there were about 30 DAP-related sessions ranging from “Audience Building in the Age of Platforms,” to “Storytelling from the Smartphone Lock Screen,” to “Charge Up Your 2016 Election Coverage: Create a Computational Campaign” (ONA16, 2016).

Shifts in organizational structures, experimentation, and conference events are all concrete reactions to the destabilization of established professional journalists and the news industry in general. This exploration and participation reflects attempts by legacy news organizations to understand and engage with the new playing field. At this point,
however, the use of data and analytics in editorial work to understand who is interacting with a story and also to inform future coverage was still in its infancy (Howard, 2014).

Furthermore, preinstitutionalization does not occur without challenges. According to Waite (2011):

It’s tempting to say that a real critical mass is afoot, marrying journalists and technologists and finally getting us to this ‘Future of Journalism’ thing we keep hearing about. I’ve recently had a job change that’s given me some time to reflect on this movement of journalism + programming. In a word, I’m disappointed (p. 1).

During this stage, much of the preinstitutionalization activities were external and not central to business models, planning, and development (Bell, 2012). According to Gabriel Dance, the interactive editor for the Guardian U.S.:

There’s not any sort of editorial or reporting divide between my team and the rest of the newsroom…the people on my team, I call them ‘interactive journalists.’ But I’m looking forward to the day we can drop some of the prefixes and leave it as ‘reporter’ or ‘journalist’…the way I see it, the web has evolved and changed the way we have the ability to tell stories. What we’re doing is simply adapting to all these new ways we have to tell stories. (Ellis, 2013, p. 3)

An alternative in the form of DAP journalists emerged as a response to the challenges associated with meeting the needs of technological and social disruption and producing more innovative, accessible, and engaging content. This exploration and experimentation, however, were conducted on an ad hoc basis and not fully integrated into newsroom routines.

**Theorization and the Legitimization of a New Form of Professional Journalists**

**Specification and justification.** Within the news industry, one way by which theorization occurs is through discussions of the connection between DAP journalists and industry challenges. For example, The New York Times published an internal Innovation
Report in 2014 (and was subsequently leaked to the public), which emphasized the veteran organization’s struggle to compete in modern news. The shift toward DAP journalists—*the solution*—is framed as an imperative, “The only way to ensure that our report keeps pace is to build a newsroom with a deeper and broader mix of digital talents: technologists, user experience designers, product managers, data analysts, and most of all, digitally inclined reporters and editors” (Sulzberger, 2014, p. 91). The report continues:

We want makers, who build tools to streamline our newsgathering; entrepreneurs who know what it takes to launch new digital efforts; reader advocates, who ensure that we are designing useful products that meet our subscribers’ changing needs; and zeitgeist watchers, who have a sixth sense for the shifting technology and behavior. Most of all, we need those rare—and sought after—talents who can check off many of those boxes. And we need them now. (p. 91)

Furthermore, DAP journalists were justified as a solution to *the problem*—the challenges related to economics, disruption and new entrants (i.e., digital native news organizations), and technological and associated consumption behavioral changes (i.e., audience development). The most successful content—the innovations that readers found most engaging—was not being appropriately reflected by journalist talent and newsroom processes. For example:

The surprising popularity of The Times dialect quiz—the most popular piece of content in the paper’s history, with more than 21 million pages views—prompted weeks of internal discussions about ways to build on that remarkable success. But over at BuzzFeed, they were busy perfecting a template so they could pump out quiz after quiz after quiz. (Sulzberger, 2014, p. 91)

On the other hand, competitive digital native news organizations did not need to worry about new or retrained professional journalists. Instead, “[The New York Times’] competitors, particularly digital-native ones, treat platform innovation as a core function.
Vox and First Look Media have lured talent with the pitch that they have built the tools and templates to elevate journalists” (Sulzberger, 2014, p. 91).

Specification and justification of DAP journalists at The New York Times was even more explicit this past year in a memo released by Executive Editor Dean Baquet and Managing Editor Joe Kahn that accompanied the newsroom’s latest Innovation report, “The Report of the 2020 Group” (David Leonhardt, 2017). In the memo, the editors write specify that “the broader mobile landscape is increasingly a visual one—think of Snapchat, Instagram, YouTube—and we know that our mobile audience wants Times journalism to incorporate visuals even more fully into work” (Baquet & Kahn, 2017, p. 4). The editors present a four-pronged solution:

We will hire significantly more visual journalists, as well as a small number of tool builders. We will train many, many more reporters and back fielders to think visually and incorporate visual elements into their stories. We will deploy new tools, such as Oak, a major improvement to our CMS, to make it easier for the newsroom to incorporate visual journalism in stories. We are changing the siloed nature of the newsroom when it comes to visual journalism (Baquet & Kahn, 2017, p. 4).

In essence, this memo formalizes DAP journalists as a new form of professional journalists at The New York Times. This is just one example of specification and justification—albeit an example at arguably the industry’s leading organization. Indeed, according to in reference to the report, “I doubt there is a newsroom in the world that wouldn’t benefit from understanding the cultural issues laid out” (Benton, 2014, p. 5).

Similar efforts occurred at other organizations as well. As a response to challenges created by changes in the ways that audiences consume news—in this case specifically, daily traffic increasingly made up of mobile audiences—the Guardian US created a mobile innovation lab to “explore the challenges faced by journalists in the
mobile age and experiment with new ways of bringing stories to life on smaller screens” (Alikhan & Thompson, 2015, p. 2). Per the press release, the team consisted of editors, producers, designers, developers and reporters and is embedded within the Guardian’s news operations.

Theorization efforts also are present at digital native news organizations such as FiveThirtyEight. According to Silver (2014), the mission of his organization is “defined by how we cover the news rather than what we cover,” which is through data journalism and the associated professional journalists who, for example, apply statistics, visualization, and interactive development to news reporting (p. 1). These remarks accompanied the re-launch of FiveThirtyEight, which was a part of The New York Times until 2014 when it was bought by ESPN. The remarks are a manifesto and go on to call attention to the problems associated with news industry practices (Clark, 2014).

Together, these examples are illustrations of how DAP journalists were theorized within the industry. Change is portrayed as inevitable and the boundaries of professional journalists are fluid and flexible, accommodating new forms of professional journalists. Furthermore, specification and justification suggest normative alignment as represented, for example, through the idea that change is necessary in order to meet the economic realities and the changing needs of consumers.

**Moral legitimacy.** Within the news industry, this type of theorization is evident in the connection between DAP journalists and associated skills, training, and expertise provided at the professional training grounds of journalism school. As discussed earlier, Northwestern created a program merging journalism and programming in 2008. Columbia University launched an MS in computer science and journalism in 2011 and
created the Lede Program in 2014, which is a partnership between the Graduate School of Journalism and the Department of Computer Science that offers training in data and data technologies within the context of journalism (Benton, 2014). The University of North Carolina at Chapel Hill also began offering journalist-developer courses in 2014 (Spinner, 2014).

Indeed, more and more journalism schools are expanding offerings in DAP-related training. In a survey of the 113 journalism schools accredited by the Accrediting Council on Education in Journalism and Mass Communications (ACEJMC), Berret and Phillips (2016) found that more than half of the schools (59 out of 113) offered one or more data journalism courses and 69 of the schools integrate some data journalism into other reporting or writing courses. The authors of that survey use “data journalism” to represent the “journalistic purpose of finding and telling stories in the public interest” in the form of data analysis, text, visualization, or news apps and also through the use of computation, algorithms, machine learning (Berret & Phillips, 2016, p. 9). Notably, Poynter conducted a survey of news educators and news professionals in 2014 and found that 80% of educators responded that the ability to tell stories with design and visuals was a very important skill for the future of journalism, while only 52% of professionals said the same (Finberg, 2014).

This balance of intellectual and civic goals with the demands of the news industry has long been a challenge for journalism schools; technological disruption and associated new ways of consuming news has further exacerbated it (Funt, 2014). The need to be responsive to the broader news environment, however, is endorsed by another report on the state of journalism education (Lynch, 2015), which concludes that “currency—the
capacity to identify and master emerging market trends and media technologies and to integrate them quickly into journalistic work—is as critical to credible journalism education as command of Associated Press style and the inverted pyramid [were]” (part 5, p. 36). Lastly, the moral legitimacy of DAP journalists is further established through other normative developments such as the inclusion of a chapter on data journalism in the 2017 AP Stylebook, which received $400,000 from the Knight Foundation to create a set of standards and spread the use of data journalism (Hare, 2015).

**Pragmatic legitimacy.** The pragmatic legitimacy of DAP journalists as a new form of professional journalists is being established via its relationship with audience traffic and engagement. Even early on, those involved as DAP journalists affirmed the potential of this new form. According to Jeremy Bowers (2011), who at the time was a developer at The Washington Post and is now currently a Senior Editor of News Applications at The New York Times, “data-driven news applications generate traffic and engagement. And as organizations continue to prove, they’re also noteworthy pieces of important journalism” (p. 1). Traffic success was demonstrated by the work of data-journalist Nate Silver, who’s site FiveThirtyEight was responsible for 20% of all New York Times’ traffic when he left to bring it to ESPN in 2014 (Bilton, 2015). And at ProPublica, the news applications team is about 20 percent of the newsroom staff, but their projects generate about half of the of company’s online audience traffic (Klein, 2016).

Due in part to developments in technology and consumption behaviors, there are a variety of new ways to tell stories and when visual, interactive, and data elements are used in the right way and for the right story, engagement is high and business returns are
good (Wolfe, personal communication, June 16, 2017). According to Wolfe, “news organizations are seeing this as worthy investment, not just because of the great journalism – of which [she] think[s] there’s a ton – but also just from a business perspective.” Alexander (personal communication, June 29, 2017) agrees, “We get good readership numbers because we’re creating exclusive content essentially and you can’t just Google and find the same story somewhere else.” Ultimately, testimony such as this is fundamental to establishing the pragmatic legitimacy of DAP journalists.

**Cognitive legitimacy.** In addition to moral and pragmatic legitimacy, DAP journalists are gaining cognitive legitimacy. This occurs, for example, through press coverage. Figure 4-2 illustrates the rise in coverage of DAP journalists based on the trade press dataset.

Figure 4-2
Press Mentions Related to DAP Journalists (2011-2016)
Between 2011 and 2016, the number of trade press articles mentioning DAP journalists increased five-fold. In general, the number of trade press articles mentioned DAP journalists continued to grow each year between 2011 and 2016, averaging about a 38% increase. The biggest change was from 2011 to 2012, when the number of trade press articles mentioning DAP increased 60% and the smallest change was between 2014 and 2015 when the number of articles increased only 17%. Press coverage establishes cognitive legitimacy by increasing public awareness and salience of DAP journalists.

Cognitive legitimacy is also established through external awards. For example, when The New York Times received a Pulitzer Prize for its work on *Snow Fall*, content created by contributions from DAP journalists was recognized in the award statement. The Society for News Design’s “Best in Show” award has gone to multiplatform projects twice in the last four years: the 2016 award went to The New York Times for its multiplatform project, “The Displaced” and the 2014 award went to National Geographic, for its use of multiplatform storytelling.\(^\text{10}\)

Furthermore, each year ONA holds the Online Journalism Awards (OJA) to recognize excellence in digital journalism. While the OJA have existed since 2000, it wasn’t until 2015 that DAP journalists were recognized with specific award categories. The OJA introduced a new category dedicated to Excellence in Innovation in Visual Digital Storytelling that “honors exceptional and innovative efforts in telling stories through visual means: photos, graphics, illustrations, video, virtual reality or other emerging media” (OJA, 2015). Two years later, the OJA introduced another new award category, dedicated to Excellence in Immersive Storytelling, which “honors exceptional

efforts in telling stories through digital, immersive media: virtual reality, augmented reality, mixed reality, 360 video and other emerging media (Redohl, 2017).

Together, both traditional award rituals such as the Pulitzer and the Society for News Design’s “Best in Show,” and more modern incarnations such as the OJA, have moved to include and recognize DAP journalists. As ProPublica’s Klein (2016) stated about his news applications team, “we bring home prestigious journalism awards” (p. 2). This acknowledgement of cognitive legitimacy is further echoed in a story told by professional DAP journalist and interview participant:

At the Journal, you know, our team was working with the investigative reporters on the Medicare story, which won the Pulitzer Prize…We sat down with the investigative team who we had a great relationship with and were able to make this great searchable interactive database that like put a beautiful face on the whole thing to let people and the reporters used that tool to find stories that they could you know get a report out as part of a larger series. (Anonymous, personal communication, April 24, 2017)

The journalist goes on to explain how that example of cognitive legitimacy earned the team a lot of respect:

For a long time, graphics was like you know kind of like a kind of like Kinko's you go hey can we get, you know literally people would come over and be like can I get a color print out of this or like can you guys get some screen shots of this product from here and it changed to one where they saw what we were able to do…So we kind of earned a lot of respect by doing good work. (Anonymous, personal communication, April 24, 2017)

Within the context of the news industry, theorization of DAP journalists occurred through justification, alignment with industry norms and economics, and increasing public attention. Statements on imminent change and DAP journalists were evident throughout the industry and at a variety of news organizations. Connections between DAP journalists and both the normative aspects of the news industry (e.g. J-school training) and the pragmatic aspects of the news industry (e.g. audience engagement,
traffic, and economics) were apparent. Furthermore, publications and ritual award ceremonies both reflected increasing legitimization of professional DAP journalists. In sum, these theorization activities set up the next stage of institutional change, diffusion.

**Diffusion: Growth in Professional DAP Journalists**

Within the news industry, diffusion is the stage during which news organizations would increasingly hire DAP journalists or launch DAP teams. As early as 2014, data journalism was declared “mainstream” and the market for data journalists was “booming” (p. 16), estimated at “well under a thousand across [US] newsrooms” (p. 44) and continuing to grow given the demand from both traditional and digital native news organizations ranging from The New York Times and The Economist to FiveThirtyEight and Vox (Howard, 2014). While data journalist is just one of many titles representing DAP journalists, Howard (2014) qualifies his assessment in explaining that “the number of people applying data science to journalism or practicing high-level computational journalism” is much smaller, with the top talent “split between the New York Times, ProPublica, NPR, the Washington Post, the Chicago Tribune, the Wall Street Journal, and the Los Angeles Times” (p. 44).

**Replication.** At this point in time, concerns abounded regarding the replicability of DAP news such as The New York Times’ Pulitzer Prize-winning *Snow Fall* and the practicality of DAP journalists throughout the industry, especially at local and regional organizations that might now have the labor and resources to hire them (Clark, 2014). Despite a lack of resources, however, many organizations did indeed try. More than 100 *Snow Fall* imitations sprung up in 2013 alone, even sparking “a new word: Snowfalling (v., to funnel all one’s resources into a single digital story)” (Fitts, 2014, p. 1).
Snowfalling exemplifies the notion of mimetic isomorphism and helps explain the early adoption of DAP news by organizations that might not have had appropriate resources, which, recall from Chapter 2, furthers the process of diffusion. In addition to the numerous examples of news organizations hiring DAP journalists or launching DAP teams already discussed, are plentiful more examples across a variety of news organizations. As for digital native news organizations, other examples of DAP journalist diffusion include BuzzFeed’s News App team (O'Donovan, 2014a) and Vox’s data journalism team (Bell, 2015b).

**Organization-level diffusion.** Exemplifying diffusion at a more traditional news organizations, the Associated Press formed an interactive news technology team tasked with creating data-driven, interactive, and platform focused news content (White, 2013). The team is comprised of journalists with significant technical skills (e.g., data visualization and Web development) as well as investigation and story development skills—a combination that differentiates DAP journalists from other developers. According to Team Editor Troy Thibodeaux, the team represents a shift away from the “model in which visualization or interactive storytelling is an afterthought, an illustration of the story, and toward a model in which this work is central to developing the story and enables us to tell the story in ways impossible for straight text reporting” (Gillin, 2013, p. 3).

DAP journalists are diffusing to regional news organizations as well. At the Los Angeles Times, Ben Welsh runs the Data Desk, which is a team of journalists and programmers tasked with data collection, organization, analysis, and visualization (Los Angeles Times, 2017). At the Minneapolis Star Tribune, CJ Sinner is the Digital
Graphics Producer tasked with data analysis and development of interactive charts and graphics within the newsroom (personal communication, June 13, 2017). At The Oregonian, the Data-Driven Enterprise Team responsible for data journalism and the creation of data-driven applications, interactives, and visualizations (Katches, 2017).

**Objectification.** Ultimately, the diffusion of DAP journalists at a variety of news organizations reflects the merging of skills and values on behalf of the reader (Clark, 2014). In addition to an examination of diffusion within organizations, however, is a necessity to examine objectification at the industry level. Objectification, a feature of taken-for-grantedness (Berger & Luckman, 1967), plays an important role in the diffusion stage as well, especially within the context of professional journalists.

In this context, objectification is established via the increasingly visible community of DAP journalists as a new form of professional journalists. In 2016, OpenNews set out to better understand this DAP community with a News Nerd survey that received responses from 514 journalism-focused developers (Lichterman, 2017). According to the publically accessible results¹¹, 44% of respondents have been working in “journalism tech” for more than four years while this was the first “journalism tech” job for 14% of respondents. Almost three-quarters of the respondents (71%) work at news organizations.

The survey organizers note that job title was a question of particular interest to the community (Owens, 2017). More than 50% of respondents have a title of news app or interactive developer and 33% of respondents chose “other” (there were a total of eleven additional built-in choices). This lack of consensus is an oft-mentioned challenge of

¹¹ [https://docs.google.com/spreadsheets/d/12KWdyqrJ9vmEwHB07zhU1V9H5m_pgvq6b1FgWWdT4Go/edit#gid=1390922297](https://docs.google.com/spreadsheets/d/12KWdyqrJ9vmEwHB07zhU1V9H5m_pgvq6b1FgWWdT4Go/edit#gid=1390922297)
institutional change and perhaps reflects the development stage of DAP journalists as a new form of professional journalists.

On the other hand, annual conferences such as NICAR and ONA, as well as Hacks/Hackers Meetups, and even a Slack channel called News Nerdery, all contribute to an objective community for DAP journalists. NICAR attracts both journalists who have been working since the earliest databases trying to gain respect in the newsroom and emerging advanced programmer journalists who love working on data and design—a mix that contributes to an open and supportive community (Anonymous, personal communication, April 24, 2017). Schallom shares similar sentiments and explains how crucial the community is for the existence of DAP journalists:

No one paid attention to us in newsrooms and you know you weren't considered part of the core team. That has definitely changed over the last five years. But I think this community was so necessary for these people that were doing the work in the early days because they just wanted someone to talk to, you know about their work…And the community, I think is really the reason why smaller and mid-sized newsrooms can succeed in this because the bigger teams are sharing their code; they’re sharing their best practices. And we're not all starting from zero. So it's really allowed the industry, and this part of the industry to grow. (Schallom, personal communication, June 1, 2017)

**Industry-level diffusion.** The strength of this community embodies a new frontier for the news industry, which is increasingly comprised of people with coding, designing, and journalism backgrounds coming together to tell new and exciting stories. Indeed, these are not the traditional skills of newsrooms from five years ago (Hepworth, 2016). Furthermore, with this objectification, demand is following suit. According to Stencel and Perry (2016), there is a big market for journalists with experience and expertise in code, visual storytelling, audience development. For example, Figure 4-3

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12 Slack is a digital messaging platform targeted toward organization and team communication. Conversations are organized by channel. (https://get.slack.help/hc/en-us/articles/115004071768-What-is-Slack-).
illustrates the rise in job listings for DAP journalists as a percentage of total job listings within the journalism job listings dataset introduced in Chapter 3.

Figure 4-3
DAP Job Listings as a Percentage of Total Job Listings

During the period from 2011 to 2016, job listings for journalists changed considerably. According to the job listings dataset, there were 981 listings for journalist positions in 2011 and only 12 of these listings were for DAP journalist positions. In general, most of these jobs were reflective of traditional CAR and/or data-journalist positions such as this job listing for a Database Editor at The Wall Street Journal:

We’re seeking an entrepreneurial, creative journalist to launch a broad-based data-mining initiative. Our ideal candidate is a methodical reporter with a strong background in database research and reporting, with a keen eye for spotting trends and a talent for working across many subject areas and bureaus. Candidates should have experience in working with reporters, shaping coverage and teaming with disparate groups to create value for our readers-- and also be prepared to roll up their sleeves to help produce online pages and work on strategy for the Web section.
The number of DAP job listings more than doubled by 2013 to 28 DAP journalist job listings out of 1,539 journalist job listings. There were 30 DAP journalist job listings out of 1,181 journalist job listings by 2016. Notably, even as the total number of journalist job listings declined, there was an increase in DAP journalist job listings.

To illustrate the evolution of DAP journalist job listings, consider this 2016 listing for an Interactive News Developer at The New York Times:

The Interactive News desk at The New York Times is looking for creative, interdisciplinary thinkers with strong technical backgrounds…Interactive News is the special digital projects team embedded within the newsroom of The New York Times. You'll be working with editors, reporters, photographers, designers and other developers to create newsroom-facing tools and reader-facing projects that expand the horizons of our digital news report. Our department’s goal is to practice web development and software engineering as a newsroom craft. We draw on technical expertise to imagine new editorial forms. Most of our work is published in collaboration with other newsroom departments. Your role is to bring digital creativity and software expertise…No journalism experience is required...

This job listing is clear about the integration of web development and software engineering expertise and responsibility within the newsroom. Notably, explicit journalism experience is not a requirement; however, the right candidate is expected to be involved with news production and distribution.

**Barriers to complete diffusion.** Together, these developments, statements, and activities suggest that DAP journalists are generally diffusing throughout the news industry. Of course, not all news organizations have fully embraced DAP journalists in their newsrooms. According to Aron Pilhofer, who at the time was the associate managing editor for digital strategy at the New York Times and is now a professor of journalism innovation at Temple University, “The 400+ journalists at NICAR still

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13 A link to this job listing can be viewed here as of July 2017: [http://www.nytc.com/careers/newsroom/interactive-news-developer/#10663/26644](http://www.nytc.com/careers/newsroom/interactive-news-developer/#10663/26644)
represent something of an outlier in the industry, and that has to change if journalism is going to remain relevant in an information-based culture” (Howard, 2014, p. 46).

Indeed, conferences and awards foster an objective community and legitimate professional form, but there is a significant lacking in the adoption of DAP journalists particularly at smaller local news organizations where budget, infrastructure, and culture constrain adoption or even experimentation with new forms of professional journalists (Stencel, Adair, & Kamalakanthan, 2014). According to Wei, the barriers to institutional change throughout the industry are two-fold: financial resources and challenges with supply. As she explains:

I think every news organization would love to have [a DAP journalist]. I think there is a scarcity—a supply problem—and also, a financial barrier. I don’t think there are enough people who have these skills to work everywhere, like it’s not so common in the sense that every small town probably has a journalist. I don’t think the skills are so common that this is literally possible. Also, because it’s not so evenly distributed, right, so the really big places have dozens of people. But the other thing too is that there is a financial barrier. With these skills, you cost more as an employee and you’re competing—not directly, in that sense that people who do this in journalism, I’m pretty sure, don’t expect to make the same as they would in software—but, you cannot pay them the same amount that you would pay someone who has these skills in journalism. And so I think there’s a financial barrier there and places have to make the investment. (Wei, personal communication, July 6, 2017)

Even within newsrooms that have embraced DAP journalists, struggles still persist, especially regarding organizational structure and culture. As DAP journalist continue to develop as a form of professional journalist, job titles and expectations are still inconsistent, which perhaps limits the extent to which thorough diffusion and eventual institutionalization can occur. According to Eads, there currently are no agreed upon professional standards; those coming into DAP roles have varied backgrounds and complicated work histories ranging from computer science and biology to journalism and
design. Eads finds that DAP journalists are often treated as “the mistress” at legacy news organizations and while things have definitely gotten better and it varies by organization, it is “still decades off from being settled into what this means and from having the legitimacy that it deserves” (personal communication, June 13, 2017). Another interview participant agrees that it’s an “interesting” and “weird” moment right now, but adds that its “hopefully settling down a little bit more to where it will just be like, ‘Oh you’re a journalist too and you just use these different tools’” (Anonymous, personal communication, April 24, 2017).

Wolfe, on the other hand, has noticed substantial change with regards to job titles, which were different at each of her three jobs even though she generally had the same responsibilities. In 2014, Wolfe was a digital designer doing journalistic work and telling stories, but not under the purview of the newsroom. By 2015, Wolfe’s job as a news app developer explicitly included the responsibilities and expectations of a traditional editor and specifically, a byline on all news output. She explains:

It was really the first newsroom I was in where I did kind of feel like, you know with some exceptions, but for the most part, treated like a reporter with a lot of the same expectations of quality news judgment, careful editing, and that I would help not just say ‘how do we make this pretty,’ but ‘how do we tell this story best.’ (Wolfe, personal communication, June 16, 2017).

The evolution of job titles is echoed in Schallom’s description of her experience of an “amazing” transition over the last five years. DAP journalists are now core members of the newsroom, although there are still struggles to ensure their opinions are as valued as traditional journalists. “We're still fighting the good fight for equality in that, but I think we're getting closer and closer to where teams are or are more integrated in
newsrooms and are less seen as service desks” (Schallom, personal communication, June 1, 2017).

Similarly, Bell (2016) finds that “what was once a hostility by journalists toward ‘the techies’ has become an admiration and understanding that journalists with the right technical skills hold the keys to the survival and health of the field” (p. 4). The common thread among news organizations with “successfully integrated” DAP journalists (e.g. attendance at regular editorial meetings and reference to “journalist” in job titles of these professionals) is “an acknowledgment at all levels within the newsroom that technical literacy and technical skills can open the door to new forms of storytelling” (Rahman, 2015, p. 114).

The shifting of organizational, structural, and cultural barriers between DAP journalists and the established journalist profession is reflective of the progress of rapid institutional change. Full institutionalization of DAP journalists as a taken-for-granted structure throughout the U.S. news industry, however, has yet to occur. It would seem then, that the diffusion stage applies best to the current state of DAP journalists.
Chapter 5:
Employment Networks of Professional Journalists

This chapter presents the results of the second component of the research design in order to better understand the composition of the journalist profession and how it has changed from 2011 through 2015 (RQ3). The results also detail DAP journalists as compared to traditional journalists. First, descriptive results are provided to summarize data on the case study of professional journalists in New York City (NYC) news organizations. Second, an overview of the employment network of professional journalists is provided. This is followed by a deep dive into the development of DAP journalists.

As will become clear in this chapter, the findings reflect the rapid growth of DAP journalists, particularly in print, digital native, and broadcast news sectors. In addition, the results offer insight into how certain organizations emerged as leaders within the employment network. Lastly, the findings shed light on the industry origins of DAP journalists and indicate the prominence of news sectors (e.g., broadcast, print, and digital native) as drivers of DAP journalist growth over time.

Descriptive Results

The second analytical task focused on a case study of 15 news organizations headquartered in New York City. Five are broadcast news organizations, three are print news organizations, and seven are digital native news organizations, which together provide a sample that covers the three main sectors of the news industry. Ten of the companies are public or owned by a public company, while the remaining organizations
operate under some form of private structure. The founding dates vary from 1851 (The New York Times) to 2012 (NowThis); six of the organizations were founded after 2000.

Employment data were collected and aggregated for each of the organizations in this case study. Employment histories were collected for a total of 3,587 journalists, which reflects a substantive sample of journalists in the United States. For instance, according to the American Society of News Editors (ASNE), there were 32,900 full-time journalists in 2015 (Doctor, 2015); this sample thus captures approximately 11% of U.S. journalists based on the ASNE estimate.

Additional summary data on this sample of NYC news organizations and the professional journalists are provided in Table 5-1. The male to female ratio ranged from 0.54 at the Huffington Post to 1.31 at Slate ($M = 0.87, SD = 0.24$). The percentage of employees with an undergraduate degree in journalism ranged from 4% at NowThis to 31% at Fox News ($M = 20.31, SD = 0.07$). The percentage of employees with a graduate degree in journalism ranged from 4% at Patch to 19% at The Wall Street Journal ($M = 10.78, SD = 0.04$).
Table 5-1

Summary of Employment Data for Sample News Organizations

<table>
<thead>
<tr>
<th>Sector</th>
<th>Founding Date</th>
<th>Corporate Structure</th>
<th>Employees</th>
<th>M:F Ratio</th>
<th>Undergrad J-Degree</th>
<th>Graduate J-Degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABC News</td>
<td>Broadcast</td>
<td>Public (Disney)</td>
<td>463</td>
<td>0.87</td>
<td>21.81%</td>
<td>7.99%</td>
</tr>
<tr>
<td>Buzzfeed</td>
<td>Digital</td>
<td>Private</td>
<td>194</td>
<td>0.58</td>
<td>21.65%</td>
<td>9.79%</td>
</tr>
<tr>
<td>CBS News</td>
<td>Broadcast</td>
<td>Public</td>
<td>359</td>
<td>0.91</td>
<td>18.11%</td>
<td>11.98%</td>
</tr>
<tr>
<td>Daily Beast</td>
<td>Digital</td>
<td>Public (IAC)</td>
<td>42</td>
<td>0.91</td>
<td>11.90%</td>
<td>14.29%</td>
</tr>
<tr>
<td>Fox News</td>
<td>Broadcast</td>
<td>Public (Fox)</td>
<td>331</td>
<td>0.66</td>
<td>30.82%</td>
<td>5.74%</td>
</tr>
<tr>
<td>Huffington Post</td>
<td>Digital</td>
<td>Public (Verizon)</td>
<td>618</td>
<td>0.54</td>
<td>11.00%</td>
<td>7.93%</td>
</tr>
<tr>
<td>Mic</td>
<td>Digital</td>
<td>Private</td>
<td>92</td>
<td>0.67</td>
<td>23.91%</td>
<td>6.52%</td>
</tr>
<tr>
<td>MSNBC</td>
<td>Broadcast</td>
<td>Public</td>
<td>211</td>
<td>0.63</td>
<td>20.38%</td>
<td>9.95%</td>
</tr>
<tr>
<td>NBC News</td>
<td>Broadcast</td>
<td>Public (Comcast)</td>
<td>310</td>
<td>0.68</td>
<td>25.16%</td>
<td>13.23%</td>
</tr>
<tr>
<td>New York Daily News</td>
<td>Print</td>
<td>Private</td>
<td>115</td>
<td>1.25</td>
<td>28.70%</td>
<td>12.17%</td>
</tr>
<tr>
<td>New York Times</td>
<td>Print</td>
<td>Public</td>
<td>393</td>
<td>0.90</td>
<td>22.39%</td>
<td>15.78%</td>
</tr>
<tr>
<td>NowThis</td>
<td>Digital</td>
<td>Private</td>
<td>24</td>
<td>1.09</td>
<td>4.17%</td>
<td>16.67%</td>
</tr>
<tr>
<td>Patch</td>
<td>Digital</td>
<td>Private</td>
<td>45</td>
<td>1.14</td>
<td>20.00%</td>
<td>4.44%</td>
</tr>
<tr>
<td>Slate</td>
<td>Digital</td>
<td>Public (Graham Holdings)</td>
<td>30</td>
<td>1.31</td>
<td>20.00%</td>
<td>6.67%</td>
</tr>
<tr>
<td>Wall Street Journal</td>
<td>Print</td>
<td>Public (News Corp)</td>
<td>360</td>
<td>0.96</td>
<td>24.72%</td>
<td>18.61%</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td></td>
<td></td>
<td>239</td>
<td>0.87</td>
<td>20.31%</td>
<td>10.78%</td>
</tr>
</tbody>
</table>

14 Data are reflective of information current at the time of data collection (February 2016 through July 2016).
Employment Networks of Professional Journalists

As discussed in the previous chapter, two sets of networks were generated in order to analyze the development of DAP journalists and the overall employment network of professional journalists. First, two-mode networks were generated representing the relationship between professional journalists and organizations. Second, one-mode networks were generated representing the relationship between organizations that shared a journalist. Together, these networks shed light on the composition of the journalist profession and how it has rapidly changed between 2011 and 2015.

Two-mode network of journalists-by-organizations. The employment network of professional journalists was examined in aggregate over time, as well as each year from 2011 to 2015. Figure 5-1 provides an overview of the employment network based on journalist jobs and corresponding organizations. The data set is drawn from the sample of 15 focal organizations. Additional organizations are included in this specific network if a journalist who worked at a focal organization (e.g. BuzzFeed) also worked at another company (e.g. Facebook) in the employment history. In total, this network includes 3,587 journalists employed at 11,117 jobs, 3,303 different organizations, and 8,749 instances when an employee left one company and went to work for another company.

The visualization in Figure 5-1 shows the overall employment network and provides a snapshot of the organizations that are most central, as well as those that occupied a more peripheral role; the size of each organization corresponds to its degree centrality. A high degree of centrality generally indicates organizations that are likely to be more important within a network. In this network specifically, organizations such as ABC News, NBC News, and the Huffington Post occupy central positions as many
employees pass through these organizations during their careers working in NYC news organizations. Aside from the 15 focal organizations, other companies such as MTV, Vice, and Al Jazeera also occupy important positions at the center of this network, which indicates that they have a lot of employee crossover with the sample news organizations.

Together these findings highlight the importance of broadcast news organizations as central players in network. Huffington Post is a notable exception, which as the largest organization in this dataset is expected to have a central position in the network as well. In other words, broadcast news companies are responsible for a lot of the hiring and turnover within this overall employment network. This is further supported by looking at the average number of jobs per employee in this dataset. Current employees of broadcast news organizations, on average, work a greater number of jobs compared to employees currently working in print or digital native news organizations.
Figure 5-1


Note. Journalist jobs beginning each year (2011-2015) are represented by black nodes and news organizations are represented by blue nodes. Journalist nodes are uniformly sized and news organization nodes are sized according to degree. Traditional journalist jobs are represented by grey edges connecting journalists to organizations; DAP journalist jobs are represented by pink edges forming the connection. If a journalist has multiple jobs within the same organization that are mixed (DAP and traditional), the edge is colored green. Transitions to a new position within the same company are indicated with thicker edge connections. The diagram is filtered to show only those nodes with five or more connections (degree > 4) to aid in clarity of visualization. The Fruchterman Reingold algorithm was applied to create this layout.
The employment network was also analyzed on a yearly basis in an effort to visualize and examine change related to professional journalists. An analysis of the yearly networks provides a nuanced view of the most central organizations over time. Table 5-2 provides a summary of the top five most central organizations based on degree each year from 2011 to 2015. Degree centrality scores are normalized and edge weights are considered in all cases to control for network size and to allow for comparison.
Table 5-2

Top Five Organizations by Degree Centrality

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th></th>
<th>2012</th>
<th></th>
<th>2013</th>
<th></th>
<th>2014</th>
<th></th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>NBC News</td>
<td>0.11</td>
<td>Huffington Post</td>
<td>0.12</td>
<td>ABC News</td>
<td>0.17</td>
<td>ABC News</td>
<td>0.13</td>
<td>Huffington Post</td>
<td>0.16</td>
</tr>
<tr>
<td>CBS News</td>
<td>0.08</td>
<td>NBC News</td>
<td>0.07</td>
<td>NBC News</td>
<td>0.09</td>
<td>NBC News</td>
<td>0.10</td>
<td>NBC News</td>
<td>0.14</td>
</tr>
<tr>
<td>ABC News</td>
<td>0.08</td>
<td>ABC News</td>
<td>0.04</td>
<td>CBS News</td>
<td>0.06</td>
<td>CBS News</td>
<td>0.09</td>
<td>ABC News</td>
<td>0.11</td>
</tr>
<tr>
<td>Huffington Post</td>
<td>0.06</td>
<td>CBS News</td>
<td>0.04</td>
<td>MSNBC</td>
<td>0.05</td>
<td>Huffington Post</td>
<td>0.09</td>
<td>Mic</td>
<td>0.09</td>
</tr>
<tr>
<td>New York Times</td>
<td>0.05</td>
<td>New York Times</td>
<td>0.04</td>
<td>Fox News</td>
<td>0.05</td>
<td>BuzzFeed</td>
<td>0.08</td>
<td>New York Times</td>
<td>0.07</td>
</tr>
</tbody>
</table>
Across the years, the most central organizations are quite consistently broadcast news organizations. In a practical sense, this reflects the earlier finding that there tends to be greater movement of employees through broadcast organizations as compared to other sectors of the news industry. Once again, Huffington Post is an exception and also consistently has a high degree of centrality. Of note is the inclusion of BuzzFeed in 2014 and Mic in 2015, which indicates that the centrality of digital native news organizations increased over time.

Significant changes in degree centrality scores for individual organizations often tend to be explained in part by significant structural changes. For example, the degree centrality score of ABC News increased from 0.04 in 2012 to 0.17 in 2013. In 2012, ABC News announced an intended partnership with Univision to launch an English-language cable news channel targeted at the Hispanic population (Guthrie, 2012). Fusion officially launched in 2013 with 200 new employees (Chozick, 2013). This type of organizational restructuring can indeed impact year to year fluctuations in degree centrality scores.

One-mode network of organizations-by-organizations. As discussed in Chapter 3, the two-mode network was transformed into a one-mode organizational network, which was analyzed each year from 2011 to 2015. In this network, if Employee A works for The New York Times, and then in 2014 leaves The New York Times to go work for The Huffington Post, there is a relationship between The New York Times and The Huffington Post based on the movement of an employee from one company to the other. In total, this network includes 2,369 organizations and 6,795 instances when an employee moved between two organizations. The visualization in Figure 5-2 shows the aggregate
organizational network and provides a snapshot of the organizations that were central to the hiring flow.
Figure 5-2


Note. Organizations are represented by blue nodes and sized according to degree. Edges are colored in gray and sized according to weight. In other words, the more connections (shared journalists) that exist between two companies, the thicker the gray edge. In order to aid in clarity, the diagram is filtered to show only those connections with a weight greater than four and then further filtered to show only those nodes with a degree greater than one. The Fruchterman Reingold algorithm was applied to create this layout.
As expected, the most visibly central organizations are the sample focal organizations (e.g., ABC News, The Huffington Post, and CBS News), which account for the majority of hiring in the overall network (2011-2015). This visualization also reveals less expected intermediaries. For instance, companies such as Bloomberg, CNN, and the Associated Press occupy roles as intermediaries. Furthermore, it is interesting to note the tendency of employee movement within news sectors. For example, the overtly thick lines connecting ABC News, CBS News, and NBC News indicate that there is a high amount of employee crossover among these three broadcast news organizations. Similar patterns are evident in print news between The New York Times and The Wall Street Journal, for example, as well as in digital native news, such as employee crossover between Huffington Post and Mic.

Using the one-mode organizational network, it is also possible to run an alternative metric of centrality. Betweenness centrality was calculated for each organization. Table 5-3 provides a summary of the top three most central organizations based on betweenness centrality each year from 2011 through 2015. Betweenness centrality scores are normalized and edge weights are considered in all cases to control for network size.
Table 5-3

Betweenness Centrality for Top Three Organizations Each Year

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>NBC News</td>
<td>0.004</td>
<td>Huffington Post</td>
<td>0.004</td>
<td>NBC News</td>
<td>0.002</td>
</tr>
<tr>
<td>CBS News</td>
<td>0.002</td>
<td>NBC News</td>
<td>0.003</td>
<td>Fox News</td>
<td>0.001</td>
</tr>
<tr>
<td>MTV</td>
<td>0.001</td>
<td>MSNBC</td>
<td>0.000</td>
<td>CBS News</td>
<td>0.001</td>
</tr>
<tr>
<td>CNN</td>
<td>0.001</td>
<td>NY Times</td>
<td>0.000</td>
<td>Huffington Post</td>
<td>0.001</td>
</tr>
<tr>
<td>NY Times</td>
<td>0.001</td>
<td>CBS</td>
<td>0.000</td>
<td>Al Jazeera</td>
<td>0.000</td>
</tr>
</tbody>
</table>
Once again, the most central organizations (based on betweenness) tend to be broadcast news organizations early in 2011-2013. This implies that from 2011 to 2013, broadcast news organizations occupy central roles as “pass-through” organizations, meaning that employees are likely to pass through these organizations during that time. This reflects the earlier finding that there is greater movement of employees in broadcast compared to other sectors of the news industry.

There are notable differences when looking at 2014 and 2015 when digital native news organizations also occupy central betweenness positions in the network. BuzzFeed, Patch, Mic, and Huffington Post each have high betweenness scores indicating that a relatively large number of employees worked in digital native news and then went on to work at other organizations in 2014 and 2015. In a sense, while broadcast news organizations were training grounds for employees between 2011 and 2013, digital native news organizations were also important training grounds by 2014.

**Development of DAP**

At a more granular level, this analysis examines the development of DAP journalists as a new form of professional journalists. Figure 5-3 summarizes the general change in the number of DAP jobs over the examined period of time (2011-2015). Each line represents the growth of DAP within a different sector of the news industry: broadcast news, newspapers, and digital native news. Numbers are reflective of new DAP jobs as a percentage of new journalist jobs each year. The results highlight the growing prominence of DAP jobs across this period of analysis.
During the period from 2011 to 2015, journalist jobs changed both across each news sector and within the DAP category. According to the employment dataset of the case study, 1,086 new journalist jobs emerged in broadcast news, newspapers, and digital native news in 2011; 16 were DAP jobs. The number of DAP roles grew, reaching 40 out of 1,387 new news jobs in 2013 and reaching 105 new DAP jobs out of 1,845 new news jobs by 2015. In general, it is clear that there has been a significant upward trend with regards to the presence of DAP related jobs within the newsroom.

The development of DAP jobs is more nuanced when examining each news sector individually. In 2011, there were five new DAP jobs out of 664 new broadcast news jobs (<1%). By 2015, there were 31 new DAP jobs out of 899 new broadcast news jobs (4%). As for print news, there were 7 new DAP jobs out of 218 new jobs overall in 2011 (3%). By 2015, there were 33 new DAP jobs out of 356 new print news jobs (9%).
Interestingly, while the number of new DAP jobs continued to increase in print news, there was a decrease in the number of overall print news jobs, further reinforcing the prominence of DAP journalists. In digital native news, there were 4 new DAP jobs out of 2014 new jobs in 2011 (2%). By 2015, there were 41 new DAP jobs out of 590 new digital native news jobs (7%).

While the general pattern of DAP job development looks quite similar in both print news and digital native news sectors, it is comparatively much more stable in the broadcast news sector. DAP jobs have grown substantially in print and digital native news sectors, accounting for an estimated 6% of all new jobs in those sectors. In broadcast news, DAP jobs account for an estimated 2% of all new jobs.

Further insights are gained when comparing traditional news (print and broadcast sectors) to digital native news. In 2011, new DAP jobs as a percentage of total new jobs was generally the same in traditional news and digital native news. In 2012 and 2013, traditional news organizations hired more DAP workers as a percentage of total new journalists than digital native news organizations. This changed by 2015 when new DAP jobs as a percentage of total new jobs was higher in digital native news than traditional news.

The increasing importance of DAP roles is further apparent when examining the specific nature of the jobs. In 2011, there were only 16 new DAP roles listed in news organizations. The majority of these roles are social media associates and social media coordinators. In 2015, there were 73 new DAP roles listed. These jobs evenly reflected social media, data, development, and programming; over half of the job titles include reference to editor, journalist, or reporter (e.g., data journalist and news applications.
editor). This reflects a clear shift toward the integration of DAP jobs within the newsroom.

**DAP and Traditional Journalists**

The employment network of professional journalists was further examined in an effort to better understand DAP journalists as compared to traditional journalists. Figure 5-4 provides an overview of the employment network based on all DAP journalist jobs and corresponding organizations (2011-2015). All jobs that were coded as DAP were collected and ties were connected between journalists and organizations. In total, this network includes 373 jobs consisting of 153 journalists and 147 organizations.

Figure 5-5 provides a similar overview based on all traditional (non-DAP) journalist jobs and corresponding organizations (2011-2016). All jobs that were coded as traditional were collected and ties were recorded between journalists and organizations. In total, this network includes 10,748 jobs consisting of 3,434 journalists, 2,315 organizations, and 8,486 instances when an employee left one company and went to work for another company.
Figure 5-4


Note. DAP journalist jobs beginning each year (2011-2015) are represented by black nodes and news organizations are represented by blue nodes. Journalist nodes are uniformly sized and news organization nodes are sized according to degree. All edge connections are colored in grey and thickness corresponds with weight. The Fruchterman Reingold algorithm was applied to create this layout.
Figure 5-5

Visualization of Traditional Job by News Organization (2011-2015)

Note. Journalist jobs beginning each year (2011-2015) are represented by black nodes and news organizations are represented by blue nodes. Journalist nodes are uniformly sized and news organization nodes are sized according to degree. All edge connections are colored in grey and thickness corresponds with weight. The diagram is filtered to show only those nodes with five or more connections (degree > 4) to aid in clarity of visualization. The Fruchterman Reingold algorithm was applied to create this layout.
As expected, the sample news organizations are most central within the aggregated network of DAP jobs and the aggregated network of traditional jobs. Aside from these organizations, however, the findings show that Bloomberg, Newsday, and The Washington Post also occupy an important role within the DAP news network. MTV, Vice, and Al Jazeera each occupy an important role within the traditional news network. This indicates that while these organizations are not at the center of the network, they do exert influence because of the flow of employees through these organizations.

The networks for DAP jobs and traditional jobs were also analyzed on a yearly basis for a more nuanced comparison. Table 5-4 provides a summary of the top five most central organizations based on degree centrality within the network of DAP journalists each year from 2011 through 2015. Table 5-5 provides a summary of the top five most central organizations based on degree centrality within the network of traditional journalists each year from 2011 through 2015. Degree centrality scores were normalized and edge weights were accounted for in all cases to control for network size and to allow for comparison.
Table 5-4

Top Five Organizations by Degree Centrality (DAP)

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>New York Times</td>
<td>0.07</td>
<td>New York Times</td>
<td>0.08</td>
<td>New York Times</td>
<td>0.08</td>
</tr>
<tr>
<td>Newsday</td>
<td>0.04</td>
<td>Wall Street Journal</td>
<td>0.05</td>
<td>Wall Street Journal</td>
<td>0.05</td>
</tr>
<tr>
<td>Time</td>
<td>0.04</td>
<td>ABC News</td>
<td>0.04</td>
<td>Fox News</td>
<td>0.05</td>
</tr>
<tr>
<td>Fox News</td>
<td>0.02</td>
<td>NBC News</td>
<td>0.03</td>
<td>BuzzFeed</td>
<td>0.02</td>
</tr>
<tr>
<td>ABC News</td>
<td>0.02</td>
<td>MSNBC</td>
<td>0.03</td>
<td>Mic</td>
<td>0.02</td>
</tr>
</tbody>
</table>

Table 5-5

Top Five Organizations by Degree Centrality (Traditional)

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>NBC News</td>
<td>0.07</td>
<td>Huffington Post</td>
<td>0.08</td>
<td>ABC News</td>
<td>0.09</td>
</tr>
<tr>
<td>CBS News</td>
<td>0.07</td>
<td>CBS News</td>
<td>0.07</td>
<td>NBC News</td>
<td>0.07</td>
</tr>
<tr>
<td>ABC News</td>
<td>0.07</td>
<td>NBC News</td>
<td>0.06</td>
<td>Huffington Post</td>
<td>0.07</td>
</tr>
<tr>
<td>Huffington Post</td>
<td>0.06</td>
<td>ABC News</td>
<td>0.06</td>
<td>Fox News</td>
<td>0.07</td>
</tr>
<tr>
<td>New York Times</td>
<td>0.05</td>
<td>New York Times</td>
<td>0.05</td>
<td>Wall Street Journal</td>
<td>0.06</td>
</tr>
</tbody>
</table>
Within the network of DAP jobs, the most central organizations include an interesting mix over time. The New York Times, and to a lesser extent The Wall Street Journal, are consistently most central. Over time these organizations consistently hire the greatest number of new DAP journalists and implicitly may be viewed as industry leaders. The increasing presence of DAP jobs at these organizations further indicates that this is the case—The New York Times alone was responsible for, on average, 14% of new DAP jobs each year.

In 2011 and 2012, the most central organizations are a mix of print and broadcast news. Notably, two out of five of the organizations are not part of the sample news organizations. By 2013, digital native news organizations begin to play a more central role in the DAP news network with the inclusion of BuzzFeed and Mic. In 2014 and 2015, two out of five of the most central DAP organizations are digital native news.

The most central organizations within the traditional journalist network remain relatively consistent over time. As expected due to the large percentage of traditional journalists, the results are quite similar to those of the overall employment network (Table 5-2). The most central organizations tend to be broadcast news organizations, which again reflects the earlier findings that there is greater movement of employees—specifically, traditional journalists—through broadcast organizations as compared to other sectors of the news industry.

While BuzzFeed and Mic were central players in the overall employment network by 2014, the same cannot be said of the traditional journalist network. Furthermore, while print news and later, digital native news are most central in the DAP journalist network, broadcast news is consistently the most central in the traditional journalist network. In a
practical sense, these findings further reinforce the importance of digital native news organizations specifically in the DAP employment network.

**Industry origins.** In an effort to better understand the dynamics related to the development of DAP, it is helpful to examine the industries involved in DAP jobs. Specifically, two one-mode networks were used to visualize the relationship between the current industry of each DAP job and the industry of the prior job. The first network represents the relationship between industries of DAP jobs to DAP jobs and the second network represents the relationship between industries of traditional jobs to DAP jobs. Figures 5-6 and 5-7 provide the visualizations for the two aggregated networks over time (2011-2015).
Figure 5-6

Visualization of Industries for DAP Job to DAP Job (2011-2015)

Note. The visualization illustrates the movement of DAP jobs to DAP jobs among industries in aggregate from 2011 through 2015. The current industry for each DAP job is included and a directed tie is present to connect from the industry of the prior DAP job. Industries nodes are sized and colored by out-degree (i.e., a bigger and darker blue node has more outgoing connections when not accounting for edge weight). Connections are also sized according to edge weight and self-loops are included. The Fruchterman Reingold algorithm was applied to create this layout.
Note. The visualization illustrates the movement of DAP jobs to DAP jobs among industries in aggregate from 2011 through 2015. The current industry for each DAP job is included and a directed tie is present to connect from the industry of the prior DAP job. Industries nodes are sized and colored by out-degree (i.e., a bigger and darker blue node has more outgoing connections when not accounting for edge weight). Connections are also sized and colored according to edge weight and self-loops are included. The Fruchterman Reingold algorithm was applied to create this layout.
Together, Figures 6 and 7 provide an overview of the industries and sectors involved in the development of DAP jobs for the journalist network. In the aggregated industry network of DAP jobs to DAP jobs, note that while marketing is the darkest blue and thus has the greatest number of outgoing edges to other industries, when considering the weight of each edge (i.e., the number of connections to other industries multiplied by the weight of each one), print news, broadcast news, and digital native news have the greatest out-degree scores (and thus the thickest edges in the visualization). Out-degree centrality scores indicate the most central industries based on their feeding (outgoing) activity. In other words, a higher out-degree centrality score indicates an industry from which more new DAP journalist jobs emanated. Print news, broadcast news, and digital native news similarly have the highest out-degree scores in the aggregated industry network of traditional to DAP jobs. In sum, this reinforces the finding that DAP jobs are driven from within the news industry.

In general, there is not a large influx of DAP employees from industries outside of news. Overall, 34% of new DAP jobs come from a different prior industry and 51% of new DAP jobs are journalists starting at a new organization. This indicates a small, but noteworthy migration from other areas of expertise for new DAP jobs. This is especially evident when compared to the overall employment network (Figure 5-1), which highlighted the tendency of employment flow to remain siloed by news sector. In practical terms, this indicates that it is more likely for DAP journalists to be hired across industries and organizations than traditional journalists.

Once again, a network was created for each year from 2011 to 2015 for both the DAP to DAP and the traditional to DAP job hiring networks. This allows for a deeper
dive into the data in an effort to identify those industries most central for DAP development over time. Tables 5-6 and 5-7 provide summaries of the top three most central industries based on out-degree centrality within each network. Degree centrality scores are normalized and edge weights are considered in all cases to control for network size and to allow for comparison.
Table 5-6

Out-degree Centrality for Top Industries (DAP to DAP)

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Print news</td>
<td>0.63</td>
<td>Print news</td>
<td>0.88</td>
<td>Broadcast news</td>
<td>0.80</td>
</tr>
<tr>
<td>Broadcast news</td>
<td>0.50</td>
<td>Broadcast news</td>
<td>0.38</td>
<td>Marketing</td>
<td>0.50</td>
</tr>
<tr>
<td>Entertainment</td>
<td>0.38</td>
<td>Marketing</td>
<td>0.25</td>
<td>Print News</td>
<td>0.50</td>
</tr>
</tbody>
</table>

Table 5-7

Out-degree Centrality for Top Industries (Traditional to DAP)

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broadcast news</td>
<td>1.78</td>
<td>Broadcast news</td>
<td>1.73</td>
<td>Broadcast news</td>
<td>3.22</td>
</tr>
<tr>
<td>Publishing</td>
<td>0.67</td>
<td>Print news</td>
<td>0.91</td>
<td>Print news</td>
<td>2.00</td>
</tr>
<tr>
<td>Print news</td>
<td>0.56</td>
<td>Digital news</td>
<td>0.82</td>
<td>Digital news</td>
<td>1.22</td>
</tr>
</tbody>
</table>
Within the industry network of DAP to DAP jobs, print news and broadcast news remain the most central and influential in terms of their feeding activity. In other words, these news sectors are consistently the biggest feeders of those employees moving from one DAP job to another DAP job. Marketing, entertainment, and technology, to a lesser extent, each play a central role as feeder industries between 2011 and 2014. By 2015, the news industry is responsible for the top three central feeders of employees moving from DAP jobs to DAP jobs.

On the other hand, the news industry is consistently responsible for the top three central feeders of employees moving from traditional jobs to DAP jobs over time. The increasing out-degree centrality scores from 2011 to 2015 indicate clear growth in traditional to DAP journalist jobs each year. Broadcast news organizations are generally most responsible for those journalists moving from a traditional to DAP job and digital native news organizations and print news organizations are influential here to a lesser extent. Together these findings indicate that DAP journalist jobs are driven from within the news industry—especially over time—rather than drawing on expertise from outside the industry in other areas such as technology.
Chapter 6:
DAP Journalists and DAP News Organizations

This chapter presents the findings for the third research component, which examines the factors that contribute to the likelihood that someone is a DAP journalist and that an organization is a leader in the DAP journalist network. In doing so, these findings address hypotheses one through six, which collectively test the concept of rapid institutional change at both the actor level and the organizational level. The first section presents the results of the statistical tests at the actor level (H1 and H5), which is then complemented by qualitative results from interviews with professional journalists. The second section presents the results of the statistical tests at the organizational level (H2, H3, H4, H6), and is also complemented by qualitative results from the interviews.

**DAP Journalists**

Hypothesis one proposed that rapid institutional change is positively associated with moral legitimacy and hypothesis five proposed that as rapid institutional change progresses, professional change at the actor level is driven from within the industry. In order to test these hypotheses, a binomial regression was performed. The quantitative results of this statistical test, in combination with the qualitative results from interviews with professional journalists, shed light on the factors that contribute to the likelihood that a journalist is a DAP journalist. A second binomial logistic regression model was conducted to test the same combination of factors in contributing to the likelihood that a journalist is a traditional journalist (i.e., not a DAP journalist). Together, the results provide insight into actor level rapid institutional change in professionals.
As noted, assumptions regarding multicollinearity were tested and met prior to running the regressions. Correlations were examined for all variables and are presented in Table 6-1. In addition, all variables had tolerance scores above 0.10 and variance inflation factor (VIF) scores between 1.00 and 2.50, thus meeting the assumptions for a logistic regression (Leech et al., 2011).
### Table 6-1

Correlation Matrix for Independent Variables

|         | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21  |
|---------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1. GE   | -   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 2. GE – J | 0.66* | -   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 3. Years | -0.01 | -0.02 | -   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 4. Diversity | 0.09* | 0.07* | -0.01 | -   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 5. DAP/Tot. | 0.03 | 0.03 | -0.03 | 0.07* | -   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 6. PI – B | -0.09* | -0.03 | 0.02 | -0.18* | -0.08* | -   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 7. PI – D | 0.04* | 0.04* | -0.01 | 0.14* | 0.02 | -0.26* | -   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 8. PI – Print | 0.06* | 0.07* | 0.01 | 0.01 | 0.05* | -0.31* | -0.14* | -   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 9. PI – T | 0.04* | 0.01 | 0.01 | 0.23* | 0.05* | -0.13* | -0.05* | -0.07* | -   |     |     |     |     |     |     |     |     |     |     |     |     |
| 10. PI – E | 0.02 | 0.01 | 0.02 | 0.21* | -0.01 | -0.15* | -0.06* | -0.08* | -0.03 | -   |     |     |     |     |     |     |     |     |     |     |     |
| 11. PI – Pub | 0.03 | 0.01 | 0.00 | 0.3* | -0.02 | -0.21* | -0.09* | -0.11* | -0.04* | -0.05* | -   |     |     |     |     |     |     |     |     |     |
| 12. Ed. – J | -0.09* | 0.01 | 0.00 | 0.00 | -0.02 | 0.15* | -0.02 | 0.01 | -0.05* | -0.02 | -0.04 | -   |     |     |     |     |     |     |     |     |     |
| 13. Ed. – C | -0.04* | -0.01 | -0.01 | -0.05* | -0.01 | 0.07* | -0.02 | -0.07* | 0.00 | 0.00 | -0.04* | -0.22* | -   |     |     |     |     |     |     |     |     |
| 14. Ed. – B | 0.02 | 0.00 | 0.01 | -0.04* | 0.08* | -0.01 | -0.03 | -0.02 | 0.00 | -0.02 | -0.03 | -0.15* | -0.07* | -   |     |     |     |     |     |     |
| 15. Ed. – CS | 0.03 | -0.01 | -0.02 | -0.01 | 0.05* | -0.04 | -0.01 | 0.02 | 0.01 | -0.02 | 0.01 | -0.05* | -0.03 | -0.02 | -   |     |     |     |     |     |
| 16. Ed. – SS | 0.09* | 0.03 | -0.02 | 0.02 | 0.02 | -0.05* | 0.04 | -0.03 | 0.02 | -0.01 | 0.02 | -0.23* | -0.12* | -0.08* | -0.03 | -   |     |     |     |     |
| 17. Ed. – H | 0.15* | 0.09* | 0.00 | 0.07* | -0.01 | -0.14* | 0.07* | 0.09* | 0.05* | 0.01 | 0.07* | -0.34* | -0.17* | -0.11* | -0.04* | -0.18* | -   |     |     |     |
| 18. Ed. – NS | 0.07* | 0.02 | -0.02 | -0.02 | 0.01 | -0.05* | 0.03 | -0.05* | 0.02 | -0.01 | 0.02 | -0.08* | -0.04* | -0.03 | -0.01 | -0.04* | -0.07* | -   |     |     |
| 19. Ed. – A | -0.01 | -0.05* | 0.01 | 0.06* | -0.02 | -0.02 | -0.02 | -0.04* | 0.02 | 0.07* | -0.01 | -0.19* | -0.01* | -0.06* | -0.02 | -0.01* | -0.15* | -0.04 | -   |     |
| 20. Ed. – E | 0.05* | -0.01 | 0.01 | -0.03 | 0.04* | -0.01 | 0.00 | 0.01 | -0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -   |
| 21. Ed. – M | 0.00 | -0.02 | 0.02 | 0.01 | 0.06* | -0.01 | -0.02 | 0.02 | -0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -   |

Note. Pearson’s correlation coefficient, r; N = 3,587; *p < .01)
Both models were significant. The first model assesses whether the independent experience variables significantly predicted whether or not a journalist was a DAP journalist. When all independent variables are considered together, they significantly predict whether or not a journalist is a DAP journalist at $\chi^2 = 959.08, df = 21, p < .001$. The model explains 80% (Nagelkerke’s pseudo $R^2$) of the variance in DAP journalists and correctly classifies 98% of journalists.

The second model, which is essentially a mirror of the first model, takes the opposite perspective and assesses whether or not a journalist was a traditional journalist. When all independent variables are considered together, they also significantly predict whether or not a journalist is a traditional journalist at $\chi^2 = 959.08, df = 21, p < .001$. The model explains 80% (Nagelkerke’s pseudo $R^2$) of the variance in DAP journalists and correctly classifies 98% of journalists. The aggregate results of both regression analyses are summarized in Table 6-2 including standardized coefficients, standard errors, and odds ratios.
Table 6-2
Logistic Regression Predicting Journalists

<table>
<thead>
<tr>
<th>Model I (DAP Journalists)</th>
<th></th>
<th></th>
<th>Model II (Traditional Journalists)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE</td>
<td>Odds ratio</td>
<td>B</td>
<td>SE</td>
</tr>
<tr>
<td>Grad. Ed.</td>
<td>-0.60</td>
<td>0.73</td>
<td>0.55</td>
<td>0.60</td>
<td>0.73</td>
</tr>
<tr>
<td>Grad. Ed. - Journalism</td>
<td>0.09</td>
<td>0.86</td>
<td>1.10</td>
<td>-0.09</td>
<td>0.86</td>
</tr>
<tr>
<td>Years in industry</td>
<td>0.01</td>
<td>0.02</td>
<td>1.01</td>
<td>-0.01</td>
<td>0.02</td>
</tr>
<tr>
<td>Industry diversity</td>
<td>0.19</td>
<td>0.21</td>
<td>1.21</td>
<td>-0.19</td>
<td>0.21</td>
</tr>
<tr>
<td>DAP jobs / Total jobs</td>
<td>14.00**</td>
<td>1.00</td>
<td>3,240,978.58</td>
<td>-14.99**</td>
<td>1.00</td>
</tr>
<tr>
<td>Prior - Broadcast</td>
<td>3.23**</td>
<td>0.89</td>
<td>25.17</td>
<td>-3.23**</td>
<td>0.89</td>
</tr>
<tr>
<td>Prior - Digital</td>
<td>3.31**</td>
<td>0.94</td>
<td>27.29</td>
<td>-3.31**</td>
<td>0.94</td>
</tr>
<tr>
<td>Prior - Print</td>
<td>2.86**</td>
<td>0.90</td>
<td>17.45</td>
<td>-2.86**</td>
<td>0.90</td>
</tr>
<tr>
<td>Prior - Technology</td>
<td>2.65*</td>
<td>1.14</td>
<td>14.20</td>
<td>-2.65*</td>
<td>1.14</td>
</tr>
<tr>
<td>Prior - Entertainment</td>
<td>1.59</td>
<td>1.24</td>
<td>4.89</td>
<td>-1.59</td>
<td>1.24</td>
</tr>
<tr>
<td>Prior - Publishing</td>
<td>2.08</td>
<td>1.17</td>
<td>7.98</td>
<td>-2.08</td>
<td>1.17</td>
</tr>
<tr>
<td>Ed. - Journalism</td>
<td>1.99*</td>
<td>0.84</td>
<td>7.30</td>
<td>-1.99*</td>
<td>0.84</td>
</tr>
<tr>
<td>Ed. - Communication</td>
<td>0.00</td>
<td>1.03</td>
<td>1.00</td>
<td>0.00</td>
<td>1.03</td>
</tr>
<tr>
<td>Ed. - Business</td>
<td>-0.76</td>
<td>1.27</td>
<td>0.47</td>
<td>0.76</td>
<td>1.27</td>
</tr>
<tr>
<td>Ed. - Computer Science</td>
<td>-2.32</td>
<td>2.32</td>
<td>0.10</td>
<td>2.32</td>
<td>2.32</td>
</tr>
<tr>
<td>Ed. - Social Sciences</td>
<td>0.72</td>
<td>1.04</td>
<td>2.06</td>
<td>-0.72</td>
<td>1.04</td>
</tr>
<tr>
<td>Ed. - Humanities</td>
<td>2.15*</td>
<td>0.88</td>
<td>8.62</td>
<td>-2.15*</td>
<td>0.88</td>
</tr>
<tr>
<td>Ed. - Natural Sciences</td>
<td>1.02</td>
<td>1.77</td>
<td>2.78</td>
<td>-1.02</td>
<td>1.77</td>
</tr>
<tr>
<td>Ed. - Visual Arts</td>
<td>2.20*</td>
<td>0.99</td>
<td>9.03</td>
<td>-2.20*</td>
<td>0.99</td>
</tr>
<tr>
<td>Ed. - Engineering</td>
<td>-0.17</td>
<td>21.80</td>
<td>0.85</td>
<td>0.17</td>
<td>21.80</td>
</tr>
<tr>
<td>Ed. - Math</td>
<td>0.21</td>
<td>1.64</td>
<td>1.23</td>
<td>-0.21</td>
<td>1.64</td>
</tr>
</tbody>
</table>

** = p < 0.01; * = p < 0.05
According to the results of Model I, the ratio of DAP jobs to total jobs, prior industry experience in broadcast news, digital news, print news, or technology, and an undergraduate education in journalism, humanities, or visual and performing arts are each significant predictors of the likelihood that a journalist is a DAP journalist. In other words, the odds of being a DAP journalist are greater for those with an undergraduate degree in journalism, humanities, or visual and performing arts. The odds also increase as the ratio of DAP jobs to total jobs increases and when prior jobs are in broadcast, digital, or print news or technology.

Hypothesis one predicted that rapid institutional change is positively associated with moral legitimacy, which is measured with an undergraduate degree in journalism and/or a graduate degree in journalism. While an undergraduate degree in journalism was found to be significant, a graduate degree in journalism was not. Still, moral legitimacy as measured with an undergraduate degree in journalism is positively associated with rapid institutional change in DAP journalists. Thus, hypothesis one is supported. In addition, an undergraduate education in humanities and an undergraduate education in visual arts were also found to be significant predictors of the likelihood that a journalist would be a DAP journalist.

Dependent variables in this analysis are reflective of current journalist positions in 2015, at which point the process of institutional change has already progressed into a stage of diffusion. Hypothesis five predicted that as rapid institutional change progresses, actor-level change is driven from within the industry. As noted in the results of Model I, prior experience in broadcast news, print news, and digital news positively and significantly increase the odds of being a current DAP journalist. Thus, based on the
evidence from this analysis, hypothesis six is supported. In addition, prior experience in the technology industry was also found—to a lesser extent—to be a significant factor in contributing to the likelihood that a journalist is a DAP journalist.

Hypothesis five is further supported by the significance of the ratio of DAP jobs to total jobs. As noted in Chapter 5, the ratio of new DAP jobs to new total jobs throughout the sample of NYC journalists does indeed increase each year (from 1:50 in 2011 to 1:20 in 2015). Indeed, the ratio of DAP jobs to total jobs is significant at the journalist level and that significance grows over time at the industry level. This indicates that DAP journalists remain DAP journalists and are less likely to become non-DAP journalists, which further reinforces the institutional change process of DAP journalists as it does not seem to be fleeting.

In an effort to compare the driving factors behind rapid institutional change at the actor level, a second model was calculated testing those factors that contribute to the likelihood of a journalist being a traditional journalist. According to the results of Model II, when all of the variables are considered together, the ratio of DAP jobs to total jobs, prior industry experience in broadcast news, digital news, print news, or technology, and an undergraduate education in journalism, humanities, or visual and performing arts are each significant and negative predictors of traditional journalists. In other words, the odds of being a traditional journalist are lower for those with an undergraduate degree in journalism, humanities, or visual and performing arts. The odds are also increasingly lower as the ratio of DAP jobs to total jobs increases and when prior jobs are in broadcast, digital, or print news or technology.
**Qualitative findings.** The results of this statistical analysis are further contextualized with an integration of results from the qualitative analysis of interviews with professional journalists. Several themes emerged from the qualitative analysis regarding the driving forces behind rapid institutional change and the factors that increase the likelihood of a journalist being a DAP journalists. Together, these results provide further support for hypotheses one and five.

Early stages of institutional change were driven by experience and expertise from outside the news industry. Several of the interview subjects are themselves examples of professionals from technology and science industries that first came into the news industry as DAP journalists. As noted previously, professionals from the Medill/Knight and Knight-Mozilla programs exemplify early institutional change driven from outside the industry. As one participant in the program explains: “time outside the bubble is helpful” (Alexander, personal communication, June 29, 2017). Job descriptions required the ability to code and those with the ability to fulfill the position at the time were outsiders with “fresh talent and new ideas…not standard pick a lot of newsrooms choose (Boyer, personal communication, June 5, 2017).

Some outsiders, however, did not prove successful. As Medley (personal communication, June 1, 2017) describes regarding a hiring experience:

The person that we hired did not have a background in journalism…she didn’t come to us from a journalism job…she had more of the social media background, but not necessarily for a news publisher. If it’s a news organization, you need to have good news judgment, that’s number one.

Echoing Medley’s experience, another participant explains how “frustrating” it was early on when hiring DAP journalists who did not come out of a journalism program— “it was...
very hard to instill a kind of passion or curiosity for the news” that was required (Anonymous, personal communication, April 24, 2017).

Early in the change process, it was rare to find someone who had great journalistic skills and great coding skills. When people came in from outside the news industry to fill DAP journalist positions, they first came in from areas that valued analytics and code skills. Such a scenario “created friction at the beginning of the evolution” (Anonymous, personal communication, October 7, 2016).

Successful newsrooms then found ways to combine these skills to produce this type of news in teams (Wolfe, personal communication, June 16, 2017). One participant managed a team, for example, that consisted of developers and traditional journalists. This enables “strong journalistic sensibilities who understand ethics,” and “good critics, as well as good sort of observers of the kinds of things that are being done today within the realm of journalism” (Anonymous, personal communication, October 7, 2017).

At the other end of the spectrum, however, is the emergent theme that news industry experience is paramount and a crucial mechanism driving current institutional change and DAP journalists. For Schallom (personal communication, June 1, 2017), “journalism has always been the most important part.” She goes on to explain that early in her career, she “worked with people who didn’t care about the journalism” and when it came time to hire for her own team, a lack of journalism experience was a non-starter. As another participant emphasized, “[journalism] experience is optimal…it’s easier to teach [DAP] skills than to actually teach journalistic sensibility” (Anonymous, personal communication, October 7, 2016).
Several participants emphasized the ability to learn DAP journalist-related skills on the job. According to Playford (personal communication, July 2, 2017), he always felt he would have a better shot at being able to program as reporter than the other way around.” Indeed, DAP journalist skills like coding are “skill based learning mechanism and you can teach yourself how to do that” (Wei, personal communication, July 6, 2017).

For journalists who entered the industry before or during the early stage of institutional change, however, there was little to no guidance toward DAP in journalism schools. One participant, for example, graduated from a journalism program that had not yet adapted to the emergence of the DAP journalist. Once out in the industry, it quickly became clear “how much more potential there was that was not being tapped and I didn’t even have the skills to understand how to start” (Sinner, personal communication, June 13, 2017). Playford is working to fix that problem. He explains, “The path that I took to learn both programming and reporting didn’t exist…Now, I’m trying to find ways to make those paths exist here (Playford, personal communication, July 2, 2017).

In fact, there is a way to see DAP journalist skills as compatible with traditional journalists jobs. As Wei explains below, journalists with certain backgrounds and positions can actually learn skills like coding easily because of aspects of their jobs that might not immediately seem related:

We found that anyone who has a copy editing background does really well programming because they're already fine-tuned to paying attention to details in the actual letters and punctuation of words. And a lot of programming is getting those fine details of literally what you type and the punctuation that goes around it correct so the computer can actually understand the commands you're issuing. We also found that people who already do data journalism, people who are in the NICAR community, they're already really interested in data analysis, and so for them, learning how to code either helps them accomplish their data analysis more quickly, or it allows them to do an interactive presentation of the analysis that
they do. (Wei, personal communication, July 6, 2017)

Shedding light on these connections highlights the utility of DAP journalist skills for traditional journalists, which contributes to the current drive of change from within the industry. Indeed, the position of a modern journalist is more than what was once considered as that of a traditional journalist and requires a broader skillset than your traditional “His Girl Friday reporter” (Anonymous, personal communication, June 2, 2017). As Wei explains:

Writing code and being able to understand data is integral to journalism as a whole. [Journalists] need to move in the same way that the world moves. Every industry is affected by big data right now and if we can’t understand it ourselves, we can’t check what people are saying. These skills are accessible, which is so incredibly helpful, especially for an industry in which the main goal is to tell the truth. We need a lot of tools to do that. (Wei, personal communication, July 6, 2017)

Numerous interview participants echoed Wei’s sentiments and consider themselves journalists first. According to one participant, “A significant percentage of us went through some kind of journalism training or came up through some kind of newsroom. Most of our (DAP) team comes from a print background” (Anonymous, personal communication, July 14, 2017). Indeed, the general consensus of participants holds that as rapid institutional change related to DAP journalists continued to progress, professional change is driven from within the industry. As such, these findings add qualitative evidence in support of hypothesis one.

Together, these qualitative and quantitative results shed light on the process of rapid institutional change at the actor level. Specifically, moral legitimacy (as signaled by an undergraduate degree in journalism) and prior experience in the news industry are significantly associated with the likelihood that a journalist is a DAP journalist. In
practical and theoretical terms, the results of this analysis highlight the role that education and prior employment experience play in rapid institutional change in the journalist profession.

**DAP News Organizations**

At the organizational level, rapid institutional change is expected to be positively associated with pragmatic legitimacy (H2) and cognitive legitimacy (H6). Rapid institutional change is expected to be negatively associated with organization age (H3) and size (H4). A multiple linear regression was conducted in order to test the aforementioned hypotheses. The quantitative results of the multiple linear regression, in combination with the qualitative results from interviews with professional journalists, shed light on the factors that contribute to the likelihood that a news organization is a leader in DAP journalist employment network. For the sake of comparison, a second regression model (Model IV) was conducted to test the same combination of factors in contributing to the likelihood that a news organization is a leader in the traditional journalist employment network. Together, the results provide insight into organizational level rapid institutional change in professionals.

As mentioned in Chapter 3, correlations were examined prior to running the regression. They are presented along with the means and standard deviations of each variable in Table 6-3. Goodness of fit measures (ANOVA) were also used to validate the results of the regression.
Table 6-3

Correlation Table Including Means and Standard Deviations

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Revenue</strong></td>
<td>2,333.44</td>
<td>3,342.04</td>
<td>-</td>
<td>-0.26</td>
<td>-0.24</td>
<td>.520*</td>
<td>0.31</td>
</tr>
<tr>
<td><strong>2. Cognitive legitimacy</strong></td>
<td>0.03</td>
<td>0.03</td>
<td>-</td>
<td>-</td>
<td>-0.23</td>
<td>-0.36</td>
<td>-0.24</td>
</tr>
<tr>
<td><strong>3. Pragmatic legitimacy</strong></td>
<td>0.08</td>
<td>0.16</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.21</td>
<td>0.33</td>
</tr>
<tr>
<td><strong>4. Age</strong></td>
<td>49.47</td>
<td>51.82</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.45</td>
</tr>
<tr>
<td><strong>5. Size</strong></td>
<td>182.00</td>
<td>178.63</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

N = 15; * = p < 0.05

The aggregate results of the regression analyses are summarized in Table 6-4. The results of both models were significant; the first model was significant at $F(5, 9) = 3.54$ $p < 0.05$, and the second model was significant at $F(5, 9) = 3.73$ $p < 0.05$. Standardized coefficients are used in reporting.

Table 6-4

Multinomial Regression for Central News Organizations

<table>
<thead>
<tr>
<th></th>
<th>Model III DAP Centrality</th>
<th>Model IV Traditional Centrality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue</td>
<td>-0.43 (0.00)</td>
<td>0.56 (0.00)</td>
</tr>
<tr>
<td>Cognitive legitimacy</td>
<td>-0.04 (0.24)</td>
<td>-0.25 (0.38)</td>
</tr>
<tr>
<td>Pragmatic legitimacy</td>
<td>-0.32 (0.05)</td>
<td>-0.23 (0.07)</td>
</tr>
<tr>
<td>Age</td>
<td>1.04* (0.00)</td>
<td>0.17 (0.00)</td>
</tr>
<tr>
<td>Size</td>
<td>-0.26 (0.00)</td>
<td>-0.03 (0.00)</td>
</tr>
</tbody>
</table>

Note. Standardized coefficients reported. Standard errors are in parentheses.

* = $p < 0.05$

Model III $R^2 = 0.48$; $F(5, 9) = 3.54$

Model IV $R^2 = 0.50$; $F(5, 9) = 3.73$
According to Model III, the combination of revenue, age, size, pragmatic legitimacy, and cognitive legitimacy significantly predicts organizational leaders in the DAP journalist employment network. The adjusted variance ($R^2 = 0.48$), indicates that Model III accounts for 48% of the variance in DAP degree centrality. According to Model IV, the combination of revenue, age, size, pragmatic legitimacy, and cognitive legitimacy significantly predicts organizational leaders in the traditional journalist employment network. The results indicate that Model IV accounts for 50% of the variance in traditional degree centrality ($R^2 = 0.50$).

Hypothesis two predicted that rapid institutional change is positively associated with pragmatic legitimacy. As noted, two regression models were performed; pragmatic legitimacy was not significant in either model. Thus, H2 is not supported.

Hypothesis three predicted that rapid institutional change is negatively associated with age. As noted, two regression models were performed. Age was in fact significant in Model III, but positively, which is not as expected. Age was not significant in Model IV. Thus, H3 is not supported.

Hypothesis four predicted that rapid institutional change is negatively associated with size. As noted, two regression models were performed; size was not significant in either model. Thus, H4 is not supported.

Hypothesis six predicted that rapid institutional change is positively associated with cognitive legitimacy. As noted, two regression models were performed; cognitive legitimacy was not significant in either model. Thus, H6 is not supported.

In Model III, age was the only factor with a significant relationship with organizational leadership in DAP news network ($\beta = 1.04$, $p < 0.05$). In other words, age
is positively associated with institutional change at the organizational level as the process progresses. As a point of comparison, there were no significant factors associated with organizational leadership within the network of traditional news.

**Qualitative findings.** The results of this quantitative statistical analysis are further supported by a qualitative analysis of interviews with professional journalists, which further contextualize hypotheses two, three, four, and six. Several themes emerged from the qualitative analysis regarding the driving forces behind rapid institutional change at the organizational level and more specifically, the factors that increase the likelihood of a news organization being a leader in DAP news.

Several of the interview participants discussed the connection between legitimacy and rapid institutional change at the organizational level. Discussions of legitimacy pointed to both pragmatic legitimacy and cognitive legitimacy. As noted in prior sections, pragmatic legitimacy can be represented with connection to economic value. For instance, Wolfe offers The Wall Street Journal as one example of a leading DAP news organization. She explains, “When used in the right way for the right story, you can see good business return on [DAP journalism]. The Wall Street Journal is interested in growing subscribers and memberships and [DAP journalism] helps with that. There are numbers” (Wolfe, personal communication, June 16, 2017).

Furthermore, when discussing DAP news organization leaders, participants generally mentioned some combination of the following organizations: The New York Times, The Wall Street Journal, ProPublica, The Washington Post at the national level and The Tampa Bay Times and The Los Angeles Times at the regional level. Each of these organizations has won a prestigious award for output of DAP journalists. As
discussed in Chapters 2 and 4, these types of awards are cognitive representations of 
organizational legitimacy. Indeed, “getting your name on a Pulitzer is valuable currency” 

As one participant describes while discussing the leading DAP news 
organizations, “What are they doing in these newsroom? Winning huge awards that 
couldn’t be done with traditional storytelling” (Anonymous, personal communication, 
the significance of legitimacy. She explains:

Snowfall was a huge, interesting thing in the community because it got on the 
radar of so many traditional journalists that had no idea how we did our jobs. It 
won so many awards and other editors wanted that too. (Schallom, personal 
communication, June 1, 2017)

Legitimacy, however, was only one of several themes that emerged from the interviews. 
Participants also discussed the importance of resources (e.g., time and money), 
employees, and culture as factors that drive institutional change of DAP journalists at the 
organizational level. In other words, these characteristics were mentioned as most crucial 
for organizational success and leadership in DAP news.

The right resources were a commonly mentioned requirement for organizational 
leadership in DAP news. According to Alexander (personal communication, June 29, 
2017), “Time and money are the biggest barriers.” Eads (personal communication, June 
13, 2017) maintains that it’s “very dependent on the individuals” and that he thinks the 
most successful teams would fail to sustain themselves if those key individuals ever left. 
The right people are especially important factors in DAP leadership for smaller news 
organizations who don’t have the resources for mentoring or access to the supply of 
bigger market news organizations (Schallom, personal communication, June 1, 2017).
Indeed, resources such as time and personnel are important; however, newsroom culture was also commonly referred to as a crucial factor in DAP news organization leadership. News organizations “in general are bad at self-improvement and learning new skills—to their detriment,” says Boyer (personal communication, June 5, 2017). As Eads (personal communication, June 13, 2017) explains, “To integrate these things successfully, you have to figure out newsroom culture and fit... Figuring out where these skills have the most impact in terms of daily work process of journalism wherever you are is critical.” According the Wolfe (personal communication, June 16, 2017), news organizations that treat DAP journalists with the same respect, expectations, and responsibilities or traditional journalists “see the greatest output…the newsrooms that are integrating [DAP journalists] into the newsroom are excellent.”

Overall, a synthesis of the interviews indicates that DAP news organization leadership is influenced by a variety of factors. While hypothesis two, which proposes the significance of legitimacy, was unsupported, the qualitative findings highlight legitimacy’s role in conjunction with other factors such as resources and culture. Together, the results provided in this chapter address the driving mechanisms of institutional change at both the actor level and the organizational level by identifying the contributing factors of DAP journalists and DAP news organizations.

Together, these qualitative and quantitative results shed light on the process of rapid institutional change at the organizational level. While the role of pragmatic legitimacy (H2) and cognitive legitimacy (H6) were unsupported in the statistical analysis, the qualitative results highlight the importance of these factors in organizational leaders in DAP news. Organizational size was neither statistically significant nor
qualitatively important with regard to organizational leadership in DAP news. This implies that the number of employees in a news organization does not have a significant bearing on whether an organization is a leader (as defined by hiring trends) of DAP news or not. On a theoretical level, the findings of the above analysis indicate that organizational age is actually positively and significantly associated with rapid institutional change, contrary to what was expected. On a practical level, the findings indicate that older organizations are more likely to be leaders in the DAP journalist network with regards to hiring trends.
Chapter 7:
Discussion

DAP journalists represent the intersection of news and storytelling expertise with data, analytic, and platform responsibilities, which were once generally separate. Indeed, these news nerds are qualitatively and quantitatively different from the traditional professional journalist. In order to better understand the rise of the news nerd, this research builds on emerging scholarship and industry evidence to examine a process of rapid institutional change in the U.S. news industry. The study covers a period from 2011 to 2016, which reflects transformation beyond the transition from print news to digital news and toward a focus on professional journalists working at the intersection of news and data, analytics, and/or mobile and social platforms. In general, DAP journalists are reflective of skills such as web development, coding and programming, and data analytics and visualization to build tools, design interactive story templates, and work with large datasets. The skillsets, responsibilities, and outcomes of DAP journalists widely vary; however, they converge around a goal to produce more effective and efficient news stories by harnessing the power of technological advancements such as the rise and accessibility of big data, computing technologies, networked devices, and mobile platforms.

The first research component (Chapter 4) sought to develop a model of rapid institutional change in order to understand how it might differ from existing models of institutional change. The process of rapid institutional change focused specifically on the case of the U.S. news industry and disruption and institutional change in the journalist profession from 2011 to 2016. The second research component examined a case study of
professional journalists in 15 New York City (NYC) news organizations in order to provide a detailed and unique understanding of the composition of the journalist profession and how it has changed over time. The third and final research component investigated the factors that contribute to the likelihood that a journalist is a DAP journalist and that a news organization is a leader in DAP news and thus provided insight into the rapid institutional change process at both the actor level and the organizational level. The implications of the findings are discussed in the following sections, covering each research component in succession.

**Rapid Institutional Change in the Journalist Profession**

Research questions one and two sought to understand how institutional change occurs in a rapid time frame and how this process differs from the traditional model of institutional change. These questions were examined through an analysis of the case of the journalist profession. The results demonstrate that institutional change in the journalist profession occurred rapidly (2011-2016) with specific regard to the development of DAP journalists. The qualitative analysis of archival industry materials offers clear evidence of the disruption, deinstitutionalization, preinstitutionalization, theorization, and diffusion of DAP journalists throughout the news industry.

Moreover, the qualitative analysis of interviews with professional journalists offers a granular and contextual understanding of the mechanisms by which rapid institutional change occurred. For example, early industry change was reflective of the entrance of outsiders from technology and science industries bringing new DAP-related knowledge and expertise into the news industry. In addition, the pragmatic legitimacy (e.g., financial benefits) and cognitive legitimacy (e.g., prestigious awards) of DAP
journalists is well recognized throughout the industry. Lastly, the community of DAP journalists both within news organizations and across the news industry continues to grow and diffuse as DAP journalists continue to gain prominence.

**Institutional augmentation.** The process of rapid institutional change differs from the traditional model of institutional change in two significant ways. First, full legitimization—including the stabilization of cognitive legitimacy—occurred prior to full diffusion. Indeed, full diffusion has yet to occur, which leads to the second important difference between this model of rapid institutional change and the traditional model of institutional change—the outcome. According to extant literature, institutional change in any context is a long-term process that results in either institutionalization or failure. Greenwood et al.’s (2002) model deems the final stage reinstitutionalization, which represents the full institutionalization of something new as the taken-for-granted, natural, and appropriate arrangement; the other potential outcome is a failed fad. As noted in Chapter 2, something new gains moral legitimacy during theorization, which fosters further adoption and pragmatic legitimacy during diffusion, and eventually becomes a cognitively legitimate arrangement that is reproduced unquestionably over time. Once a new structure or routine is fully institutionalized, it is expected to survive uncritically as the authoritative approach (Tolbert & Zucker, 1996).

In the case of DAP journalists and the journalist profession, neither institutionalization nor failure occurred. In synthesizing the findings of this research project, this work proposes *institutional augmentation* as a vehicle for better understanding the process and outcome of rapid institutional change in a wide range of industries. Simply put, institutional augmentation represents institutional change that
occurs rapidly and results in neither the displacement of an existing institution nor the failure of the new one. Instead, existing institutions are augmented to allow for the coexistence of supplementary institutions. Institutional augmentation thus provides useful language for examining rapid institutional change that results in stable diffusion without full institutionalization—an outcome that differs from the traditional binary options of institutionalization or failure. The process of rapid institutional augmentation is illustrated in Figure 7-1.
Figure 7-1

Rapid Institutional Augmentation: The Case of the Journalist Profession
In the context of the U.S. news industry and the journalist profession, the process of institutional change continues to unfold. While it seems reasonable to expect that the current status of institutional augmentation will hold for time to come, the future of DAP journalists as a new form of professional journalists cannot be predicted or guaranteed. Questions remain as to whether DAP journalists will be an accepted, stable, and unquestioned structure in every newsroom or an example of a passing fad and a case of the news industry’s failed experimentation with a new form of professional journalists.

The reinstitutionalization of DAP journalists, for instance, would mean that there is no longer a distinction to be made between DAP journalists and traditional journalists. At the most basic level, reinstitutionalization could be reflected with an elimination of the qualification from journalist job titles. In other words, a data editor would not be different from an interactives editor or a news editor—they would all just be editors using any tools necessary to tell the best stories and get them in front of the right audiences. For some on the inside of the news industry, this has always been the case. As one DAP journalist explains:

There is no distinction for me. I know what stories to tell and [which] will be great for journalism and those stories require certain skillsets, and I use them to tell the stories that I want to tell…[the news industry] needs to move away from focusing on the technology and focus instead on the content. (Anonymous, personal communication, July 14, 2017)

Clearly, however, the lack of distinction is not the current case for the news industry as a whole. DAP journalists are not so generalizable that there is no longer any differentiation between them and traditional journalists. In other words, DAP journalists have not been reinstitutionalized, nor have they failed as a trend or fad. Furthermore, this status is expected to endure over time. It is not expected that in a few decades, every professional
journalist will be a DAP journalist nor will the notion of DAP journalists have fizzled out.

In the short term, at least, it seems reasonable to expect that the current institutional structure of the journalist profession will not be displaced. However, DAP journalists are more than a failed fashion or fad. As discussed in Chapter 4, each of the indicators of institutional change occurred—disruption and the upending of established practices, exploration and experimentation, legitimization and the diffusion—yet, the process still falls short of reinstitutionalization. Practically, it is reasonable to predict that DAP journalists serve (and will continue to serve) as an augmentation of professional journalists. This research thus proposes institutional augmentation is a viable outcome of rapid institutional change. The original institution of professional journalists is unchanged and an addition exists that allows the original to remain the same.

In practice, institutional augmentation in the journalist profession is illustrated with the following quote, which highlights the non-reciprocal relationship of journalists and DAP journalists:

I learned how to write code on the job at one point and now I basically could be a computer software engineer at a computer software engineering company. Why couldn’t someone do that while they were also working at a newspaper? I don’t really see any reason why that’s not something someone could do. I don’t think it’s something that everyone should do—right, it takes a lot of time, it takes a lot of effort, you have to put a lot of energy into it to be good at it and there are people here who are using 150% of their energy to ask the President hard questions. Should they be also learning to write code? No. They should be working with other people who are good at that and communicating what they need in a way that it can get done. (Anonymous, personal communication, July 12, 2017)

In other words, any journalist can be a DAP journalist, but not every journalist should be a DAP journalist. The journalist profession has augmented enough so that both can coexist without one displacing the other.
The case of the journalist profession illustrates that there is a space for institutional change that occurs rapidly and results in an alternative outcome. This research thus proposes a middle ground: institutional augmentation as an alternative outcome of institutional change, especially for a process that occurs in a rapid time frame. Theoretically, the case of professional journalists thus represents an often-neglected aspect of institutional change – outcomes other than reinstitutionalization (and displacement) or failed fad (Kosterich & Napoli, 2016; Micelotta et al., in press; Thornton, Ocasio, & Lounsbury, 2012).

Furthermore, the notion of institutional augmentation also sheds light on another dimension of institutional change that has received little attention: the extent of institutionalization can vary according to the stage of institutional change. For instance, DAP journalists are legitimate and fully recognized as a structure throughout the news industry. “We’re in a space that we weren’t in five or six years ago. Everyone knows what it [DAP journalists] is,” says one DAP journalist (Anonymous, personal communication, July 14, 2017). As another explains, “Most if not all news organizations understand that these [DAP journalists] are possible, even if they don’t have one” (Wei, personal communication, July 6, 2017).

These quotes illustrate how institutional change in DAP journalists has been fully theorized. However, from a diffusion perspective, DAP journalists have not undergone full institutional change: “The community is growing but not every news organization has [a DAP journalist]. There are not enough people” (Wei, personal communication, July 6, 2017). From an organizational hiring perspective, “[DAP journalists] can fall from incredibly necessary to ‘no, we need other skills first’” (Anonymous, personal
communication, July 14, 2017). As is evident from these discussions on theorization versus diffusion, the extent of institutional change can vary depending on the stage of the process. The notion of institutional augmentation provides the space for a more nuanced approach to evaluating the extent of institutional change, which can vary especially when occurring in a rapid time frame.

**Professional Journalist Employment Network**

The second research component (Chapter 5) applied social network analysis to a case study of professional journalists in 15 NYC news organizations. The findings provide insight into the composition of the journalist profession and how it has changed from 2011 through 2015, thus addressing the third research question of this dissertation. In doing so, these findings also further understanding of the development of DAP journalists, and specifically as compared to traditional journalists.

**Overall employment network.** First, the descriptive statistics of the professional journalist employment network provide an assessment of the current makeup of professional journalists in NYC. In aggregate, ABC News, The Huffington Post, and CBS News are responsible for the majority of hiring in the overall network. Aside from the 15 focal organizations, Bloomberg, CNN, and the Associated Press occupied roles as important intermediaries as well. This indicates that while these organizations are not at the center of the network, they do exert influence within the NYC journalist employment network because of the flow of employees through these organizations.

Furthermore, the aggregate network indicates a tendency of employee movement as siloed within news sectors. In both practical and theoretical terms, this implies that even though turnover and crossover is particularly common in news and media industries
(Ognyanova & Monge, 2013; Weber, 2012), interorganizational personnel flow tends to remain siloed by news sector. In effect, this limits the exchange of skills and knowledge across the print, broadcast, and digital native news sectors.

Lastly, two centrality measures were calculated to assess change in the network over time. Broadcast news organizations were consistently most central by degree, which implies a tendency toward greater movement of NYC journalists through broadcast news organizations as compared to other sectors of the news industry. As the rapid institutional change process progressed, digital native news organizations also played an increasingly important role in the NYC journalist network as a greater number of employees moved through these organizations as well.

Broadcast news organizations were also consistently most central by betweenness towards the beginning of the institutional change process (2011-2013), which implies that these organizations occupied important roles as bridges between other organizations in the network. As the rapid institutional change process progressed, digital native news organizations also played an increasingly important role as bridges within the NYC journalist network.

These network measures duplicate each other somewhat, but it would be possible for one sector to be highly central based on degree and only connected to one other sector, which would result in a relatively low betweenness centrality score. Furthermore, the magnitude of difference with regard to betweenness centrality scores is less than the magnitude of difference with regard to degree centrality scores. In other words, the difference in betweenness scores for the top broadcast news organizations and digital
native news organization is at most 0.003 (see Table 5-3) while the difference in degree scores is at most 0.05 (see Table 5-2).

A high betweenness score does not mean that these organizations are subject to high turnover; rather, it is possible that these organizations are training grounds for people who move out into other news sectors. In practical terms, broadcast news organizations, and later, digital native news organizations tend to be more influential as far as incoming and outgoing jobs within the network (degree). Similarly, broadcast news organizations, and later, digital native news organizations tend to be more influential as far as bridges through which employees move throughout the network.

**DAP development.** The findings demonstrate the rapid and substantial growth of DAP journalists throughout the news industry. DAP journalist employment has indeed increased in both print news and digital native news sectors, accounting for an estimated 6% of all jobs in those organizations. In the broadcast news sector, DAP journalist jobs accounted for an estimated 2% of jobs. While broadcast news organizations are central to the overall journalist employment network, they are evidently less prominent in the development of DAP news when compared to the industry as a whole. Furthermore, as the number of new DAP journalist jobs in print news continued to increase over time, the number of new journalist jobs in print news overall continued to decrease. This is in line with general news industry trends as jobs at traditional news organizations continue to decrease and further reinforces the finding of an increasing ratio of DAP jobs to total jobs.

During early stages of the process of rapid institutional change, traditional news sectors (i.e., print and broadcast) hired a greater number of DAP journalists (as a
percentage of all new hires). This pattern reversed by 2015, at which point digital native news organizations led the way in DAP hires. In a practical sense, this finding sheds light on the growing importance of digital native news organization in DAP news over time.

**Organizational leaders.** A variety of network measures were also generated to investigate the organizations that led within both the traditional journalist network and the DAP journalist network. Within the employment network of DAP journalists, print news organizations (specifically, The New York Times and to a lesser extent, The Wall Street Journal) are consistently the most central organizations. In this case, centrality measures were based on degree centrality, which implies that these organizations are responsible for the most hiring and/or turnover of DAP journalists. This finding points to the importance of The New York Times, for example, as a training ground or hub for DAP journalists.

Interestingly, during the early stages of rapid institutional change (2011), two of the most central organizations (Newsday and Time) were not part of the 15 focal organizations. This indicates that early change regarding the hiring of DAP journalists came from the periphery of the journalist employment network. This finding is in line with the work on institutional change, as change tends to be initiated by external players. As the rapid institutional change process progressed, digital native news organizations played more of a central role, reinforcing the growing importance of digital native news organizations in the NYC DAP journalist employment network as a greater number of DAP journalists moved through these organizations.

Comparing the central organizations of the DAP journalist employment network to the central organizations of the traditional journalist employment network offers
further interesting implications. The results indicate that while broadcast news organizations were consistently the most central within the network of traditional journalists over time, print news organizations and later digital native news organizations were most central within the network of DAP journalists. This implies the consistent domination of the overall employment flow (hiring and/or turnover) by broadcast news organizations in the traditional journalist network, and again reinforces the importance of digital native news organizations, specifically in the DAP network. In general, digital native news organizations were leaders with regards to the hiring of DAP journalists, which reflects the flexibility and adaptability to change of these newer entrants.

**Industry origins.** Out-degree centrality measures were used to assess the industry origins of DAP journalists. Here, the results demonstrate the prominence of news sectors as drivers of those employees moving from one DAP job to another DAP job. In other words, the news industry was most central with regards to outgoing DAP jobs. Early on during the process of rapid institutional change, marketing, entertainment, and technology also played a central role as feeder industries, albeit to a lesser extent than news. By 2015, as the process progressed, news sectors were consistently the most central feeder of new DAP journalist jobs.

By 2015, the growth of DAP jobs is driven from within the news industry and not via external industries or expertise. In part, this means that DAP journalists are being hired from within the industry, and thus are likely more familiar with existing tenets of the industry. On the other hand, this can also suggest that at this stage of the institutional change process, journalist hires are not necessarily bringing a fresh perspective to a given job. In other words, while early hires came from external industries, which may actually
have accelerated the institutional change process, current DAP hires reinforce the existing practices of the news industry and the institutional influence of routines. This decrease in diversity of industry experience over time is indeed reflective of the rapid institutional change that has occurred and further supports the idea of institutional augmentation and the coexistence of both traditional journalists and DAP journalists without displacement or failure.

**Multi-Level Rapid Institutional Change**

The final research component (Chapter 6) investigated the factors that contribute to the likelihood that a journalist is a DAP journalist (H1 and H5) and the factors that contribute to the likelihood that a news organization is a leader in the DAP journalist employment network (H2-H4, H6). Together, the results of these analyses provide insight into the rapid institutional change process at both the actor level and the organizational level.

Hypothesis one and five examined rapid institutional change at the actor level by using a binomial logistic regression to analyze the factors that contribute to the likelihood that a journalist is a DAP journalist. Moral legitimacy (education) and employment experience (prior industry) were tested as contributing factors to the likelihood that a journalist is a DAP journalist. Simply put, the odds of being a current DAP journalist are increasingly greater for those with an undergraduate degree in journalism, humanities, or visual and performing arts. Thus, moral legitimacy is positively associated with rapid institutional change. The odds of being a DAP journalist are greater as the ratio of DAP jobs to total jobs increases, and are also greater when prior jobs are in broadcast, digital, or print news or technology
**Moral legitimacy.** Institutional theory sheds light on the importance of moral legitimacy for institutional change (H1), and specifically the role of normative alignment. In the case of the journalist profession, moral legitimacy is evident with the integration of DAP-related courses into journalism education programs. Both qualitative and quantitative findings support the hypothesis that moral legitimacy is positively associated with rapid institutional change.

Indeed, education plays a significant role in the likelihood that a journalist is a DAP journalist. Journalism education is impacting the positions that journalists take on once out in the industry. The emerging DAP-related trends in journalism education (as discussed in Chapter 4) and the significance of an undergraduate degree in journalism for predicting the likelihood that a journalist is a DAP journalist indicate that moral legitimacy plays both a practical and theoretical role in the rapid institutional change of the journalist profession.

While undergraduate education in journalism was a significant predictor of the likelihood that a journalist is a DAP journalist, graduate education was not significant. It is possible that this is a result of the limited choice and lack of variance in journalism programming at the graduate school level or the insignificance of graduate school as a moral legitimacy indicator in general. According to the employment histories dataset, only 16% of DAP journalists have a graduate degree in journalism and just 27% of DAP journalists have any graduate degree, while 31% of DAP journalists have an undergraduate degree in journalism.

On a practical level, these findings reinforce broader industry data on the percentage of journalists with undergraduate and graduate degrees in journalism.
According to Willnat and Weaver (2014), 37% of U.S. journalists had a bachelor’s degree in journalism in 2013. Just 9% of U.S. journalists had a graduate degree in journalism in 2002, which is the most recent year with available data (Weaver, Beam, Brownlee, Voakes, & Wilhoit, 2007). Undergraduate education in journalism is simply more prominent and thus, more impactful. Indeed, change in DAP journalist education is leading at the undergraduate level.

Further findings indicate that an undergraduate degree in humanities or visual and performing arts are also significant predictors of the likelihood that a journalist was a DAP journalist. Many of the degrees categorized as humanities were for creative writing and many of the degrees categorized as visual and performing arts were for film. Intuitively, courses in both of these majors would touch on aspects of the news industry and/or journalistic norms necessary for practical success, which further supports the role of education as an indicator of moral legitimacy in the process of rapid institutional change. In practice, journalists are significantly more likely to be DAP journalists with the moral legitimacy that comes from formal undergraduate training in journalism and associated course topics.

**Employment experience.** While theory expects early institutional change to be driven from outside the industry, institutional change is expected to be driven from inside the industry as the process progresses (H5). Both qualitative and quantitative findings support this hypothesis and indicate that in practical terms, these theoretical ideas hold true in the case of rapid institutional change in the journalist profession. Indeed, as the rapid institutional change process progressed, current journalists are significantly more likely to be DAP journalists if the prior job was within the news industry. Prior industry
Experience in print news, broadcast news, and digital news were all found to be significant predictors of the likelihood that a journalist is a DAP journalist. On the one hand, this finding reflects an institutional tendency to reinforce existing norms of the news industry. On the other hand, however, this also indicates a dearth of new blood—fresh perspective and experience that could, potentially, foster further change. Either way, this finding reinforces the importance of attending to past experiences and established routines during times of institutional change (Shoemaker & Vos, 2009).

The significance of prior experience in the news industry is further supported with the significance of the ratio of DAP jobs to total jobs at the actor level and the growth in the ratio of DAP jobs to total jobs at the industry level (as illustrated in Chapter 5). In both practical and theoretical terms, this indicates that DAP journalists remain DAP journalists. In other words, DAP journalists are less likely to become non-DAP journalists, which further reinforces the progress of rapid institutional change as DAP journalists are not fleeting.

Prior industry experience in technology was also a significant predictor of the likelihood that a journalist is a DAP journalist—although, to a lesser extent than prior experience in the news industry. This finding is reflective of the rapid institutional change process. As change occurred (and continues to occur) in such a compressed timeframe, it is increasingly driven from within the industry, and to a lesser extent from the technology industry. This indicates that in both practical and theoretical terms, prior experience from outside the industry—specifically in the related industry of technology—continues to play an important role in rapid institutional change in the journalist profession. The importance of experience outside the news industry echoes other recent findings on
change in professions. Indeed, organizations comprised of individuals from diverse work backgrounds are more innovative (Kreiss, in press; M. de Vaan, Vedres, & Start, 2015). At the actor level, this is similarly reflective of Crossland et al. (2014) who ascertain that diversity in career histories influences the likelihood that a CEO will lead a firm through change.

Furthermore, results from Chapter 6 indicate that the same factors that drive DAP journalists (e.g., news industry experience and journalism education) are negatively significant for traditional journalists. In other words, the chances of being a current traditional journalist are significantly lower for those, for example, with prior jobs in the news industry and undergraduate education in journalism. This is not to say that traditional journalists are less likely to have prior employment in news or education in news. Instead, however, that current journalists who have experience in any of these areas are more likely to go the route of DAP journalist. It is important to note, however, that this does not imply a weakening or displacement of traditional journalists. To reiterate, these findings relate specifically to the likelihood of a journalist being a DAP journalist (or not), and do not predict the increase or decrease in the number of journalists.

Organizational legitimacy. Institutional theory sheds light on the importance of pragmatic and cognitive legitimacy for institutional change (H2 and H6, respectively). In the case of rapid institutional change in the journalist profession, pragmatic legitimacy is indicated through the economic benefits of DAP and cognitive legitimacy is indicated via external awareness of DAP. While quantitative findings do not support these hypotheses, qualitative findings do provide support for the importance of both pragmatic and cognitive legitimacy in rapid institutional change.
As discussed in Chapter 6, professional journalists repeatedly mentioned the importance of economic results and external awards as legitimacy indicators of organizations leading in DAP journalism. Based on the support for these hypotheses in the qualitative findings, the insignificance of these factors in the statistical analysis may be a result of limitations with the sample. These limitations will be discussed below in further detail. It would seem, based on theory and practice, that both pragmatic legitimacy and cognitive legitimacy do still play an important role in rapid institutional change in the journalist profession.

**Organizational age and size.** While theory points to organizational age (H3) and size (H4) as inhibitors of rapid institutional change, neither were found to be negatively significant. An organization’s size was not significant with regards to the likelihood that it would be a leader in the DAP journalist employment network. On a practical level, this indicates that the number of employees in a news organization has little bearing on whether or not it is a leader in the DAP journalist employment network.

On the other hand, an organization’s age was found to be positively and significantly associated with leadership in the DAP journalist employment network. The significance of age can perhaps be explained by its relationship with organizational size and revenue. It is well known that older organizations tend to be larger organizations with more resources. This, coupled with the recognition that comes with older organizations, offers an advantage in hiring the necessary DAP journalists. Statistically speaking, the age variable may offset the size variable as the two measures conflate with one another to a certain extent. While older organizations may not ensure long-term leadership in DAP news, it is indeed a significant stopgap.
Furthermore, leadership in the DAP journalist employment network was measured with degree centrality, which makes the connection between age and leadership less surprising. Degree centrality was measured in the aggregate employment network (2011-2015). Within the longitudinal network, central organizations with higher degree centrality scores are expected to be the established and entrenched players of the news industry with the resources necessary to acquire DAP journalists. While established theory highlights the connection of organizational age and resistance to change (Stinchcombe, 1965), other scholarship sheds light on the relationship between age and resources necessary for change (Rao et al., 2003) as may be the case for DAP journalists.

In sum, the development of DAP journalists throughout the U.S. news industry is reflective of a process of rapid institutional change, which differs from a traditional model of institutional change and is instead better represented as institutional augmentation. Focusing on a case study of professional journalists in NYC, this study provides an intricate portrait of the changing composition of the journalist profession from 2011 through 2015. An investigation of the factors that contribute to the likelihood that a journalist is a DAP journalist and a news organization is a leader in DAP news further shed light on the process of rapid institutional change at both the actor level and the organizational level.

**Theoretical Implications for Institutional Change**

Scholars have studied the process of institutional change across a variety of contexts, generating valuable insight into how and why the process occurs. Typically, however, institutional change is examined as a longitudinal process (Lawrence et al., 2001) and thus, more research is needed that attends to temporal dynamics (Micelotta et
al., in press). The case of professional journalists examined in this research heeds that call by proposing a framework of rapid institutional change. The results show the utility of this theoretical framework for studying the development of DAP journalists and for examining the process of change in professional journalists.

In addition to attending to rapid institutional change, this dissertation makes a number of other contributions to the study of the process and outcomes of institutional change. Processes of institutional change resulting in neither institutionalization nor failure are not well understood (Micelotta et al., in press). Institutional augmentation, however, serves as an explanatory mechanism for alternative outcomes of rapid change. This research proposes institutional augmentation as a critical contribution to the literature on institutional change, and especially in furthering understanding of the outcomes of a process of rapid institutional change.

Not all processes of institutional change result in institutionalization or failure. As is evident from this study on the case of the journalist profession and the recent work of Micelotta et al. (in press), the extent and outcome of a process of institutional change can vary. There is an outcome of institutional change—especially when it occurs rapidly—that has yet to be captured in the literature. Institutional augmentation is but one alternative; it is proposed here to capture the outcome of rapid institutional change for which neither displacement of an existing institution nor failure of a new one occurs. Instead, an existing institution is augmented to allow for supplementary coexistence.

Furthermore, the case of the journalist profession suggests that institutional augmentation is a useful explanatory mechanism of institutional change for other industries. Take, for example, the case of transportation and the development of electric
vehicles or the case of television and the development of social analytics for measuring audience consumption. Framing institutional change as institutional augmentation provides researchers with a basis for delineating outcomes that allow for supplementary institutional structures.

The development of electric vehicles, for example, certainly began as an attempt to displace gasoline vehicles. Ultimately, the new variant of the car did not displace the existing variant of the car, nor did it fail as a fleeting fad; instead, the two types of cars co-exist as taken-for-granted vehicular transportation options. A similar outcome occurred in the television industry with the development of social television analytics as a method for measuring the audience. Social television analytics did not displace traditional television ratings, nor did it fail as a fleeting fad; here too, both institutional structures coexist as taken-for-granted mechanisms for measuring audience consumption (Kosterich & Napoli, 2016). Indeed, institutional augmentation helps account for this alternative in which rapid institutional change results in augmentation of an existing institutional structure for the co-existence of a new one.

Finally, this study emphasizes the relevance and applicability of a mixed-method approach to studies of institutional change. This dissertation uses network analysis, regression models, and qualitative analyses in order to examine the development of DAP journalists. Qualitative research has long been used in studies of institutional change; it is increasingly important and feasible to incorporate more varied methodological tools (Ocasio et al., 2017). This research advances this perspective, utilizing qualitative research to add context to quantitative data to further understanding of rapid institutional change in the journalist profession.
Theoretical Implications for Journalism Studies

The introduction to this dissertation summarized three concerted calls in recent journalism studies literature. First, there is a need to further understanding of the changing nature of professional journalists (Franklin, 2014). Second, there is an urgency for doing so by specifically interrogating the role of data and interrelated concepts throughout the news industry (Lewis, 2015). Third, is the continued importance of institutional approaches to studying transformation in the news industry (Ananny & Crawford, 2015; Coddington, 2015). This study responds to these three calls by applying a theoretical framework of institutional change to the development of DAP journalists. As such, findings from this research have a number of implications for journalism studies.

Institutional augmentation with regard to DAP journalists and the journalist profession is a central contribution of this research to journalism studies as well as institutional studies. Prior work on institutional change in media finds that oftentimes the symbolic relevance of something new is just as important as its economic relevance (Lowrey, 2012). The notion of institutional augmentation provides language for describing a similar scenario. DAP journalists are fully theorized—their symbolic relevance and legitimacy is pervasive throughout the industry; however, they are not fully diffused—their economic relevance is realized to the extent that they have displaced traditional journalists. In other words, rapid institutional change in professional journalists has resulted in an augmentation of traditional journalists to allow for coexistence of DAP journalists.
Furthermore, in examining thousands of journalist employment histories, a unique dataset was created from which to analyze change in the composition of the profession. As such, these findings shed nascent light on the growth and development of DAP journalists. In addition, they provide insight into the role of organizational leaders in the movement of both traditional and DAP journalists throughout the industry during a period of rapid change.

**Practical Implications**

In addition to the above theoretical discussions, the findings of this dissertation also provide a number of practical implications for both the news industry as well as for a wider variety of industries. With regard to the practice of news, the key findings in this study indicate that rapid institutional change in the journalist profession has indeed occurred. News organizations increasingly integrate DAP journalists into the newsroom. Rapid institutional change occurred; however, it did not result in institutionalization and displacement of traditional journalists for DAP journalists.

The current scenario is best represented as institutional augmentation. DAP journalists are legitimate and fully theorized; as a whole, the news industry has a taken-for-granted understanding of DAP journalists. However, they are not yet fully diffused. This is partly due to a lack of resources—both on the organization end, but also with regards to the supply. Indeed, not every traditional journalist is a DAP journalist. Instead, professional journalists have augmented to allow for the space and coexistence of DAP journalists. News industry practitioners can benefit from an understanding of the potential alternative outcomes of rapid institutional change.
The findings from this research also answer some important questions about the mechanisms that drive rapid institutional change and professional journalists. For example, experience and education from within the news industry are found to be significantly increase the odds of a journalist being a DAP journalist. While some of the early—and perhaps more familiar—examples of DAP journalists are those coming from outside the traditional experiences of journalists, this is not the case for the majority of current DAP journalists.

In some ways, those DAP journalists following an atypical news industry path are suggestive of “black swans,” a term coined by (Taleb, 2007) and applied to the 2008 financial crisis. A black swan describes an unpredictable occurrence that deviates from the norm and yet has significant implications. In the context of DAP journalists, some of the most prominent DAP journalists are those who came from technology or science industries and arguably made significant impacts on the change process (e.g., Brian Boyer and David Eades). The findings suggest however, that this is not the typical case. News practitioners can thus benefit by investing in the training of traditional journalists for DAP journalist positions.

The shift toward DAP positions is of course not unique to the news industry. As discussed in the introductory chapter of this dissertation, a variety of industries are impacted by the increased role and relevance of data, analytics, and platforms. Thus, the relevance of these findings on rapid institutional change extends beyond the confines of the news industry. In general, the results of this research shed light on the different outcomes of rapid institutional change and specifically in understanding when something new is real (as in, an institution), when it is a trend (as in, a failed fad), and when it is
somewhere in the middle (as in the case of institutional augmentation). This knowledge has the potential to guide organizational decision-making regarding the investment of time and resources into new things, such as in the hiring of professionals.

**Limitations**

While this dissertation makes important contributions to both existing theories of institutional change and existing knowledge about professional journalists, there are of course a number of limitations to the study. While the archival industry materials and interviews were analyzed as representations of the news industry, the employment history data (and thus the findings in Chapter 5 and 6) do not capture the full scale of the news industry. The dataset used in Chapters 5 and 6 represents professional journalists at a sample of 15 NYC news organizations.

This dataset was compared with the 2016 American Society of News Editors (ASNE) survey of newsrooms. On a whole, the sample of professional journalists used in this study was somewhat skewed toward female journalists. ASNE (2016) survey results found that 61% of fulltime journalists were men and 39% were women. The data used in this study has 46% men and 54% women. Indeed, the NYC news market is a likely media bubble, and while it may not be completely representative of newsrooms across the country, it serves as a fairly large representation of professional journalists (Shafer & Doherty, 2017). A more comprehensive sample would capture a wider range of professional journalist employment histories and thus more accurately reflect the industry as a whole. As such, this is a potential and important avenue for future research.

Furthermore, although these 15 NYC news organizations resulted in a large sample of professional journalists (N= 3,587) for the regression testing DAP journalists,
the regression testing DAP news organizations was thus limited to a sample of 15. This is clearly a very small sample size; a more comprehensive sample would further establish greater generalizability of the findings reported here in exploring the process of rapid institutional change, and specifically the factors that contribute to the probability of a news organization being a leader in DAP news. Future research should explore this by expanding on the case study.

The regression examining rapid institutional change at the actor level and testing the factors that contribute to the likelihood of a journalist being a DAP journalist also has an additional limitation. The odds ratio for the DAP jobs to total jobs variable is large, which suggests a high correlation with the dependent variable ($r = 0.83$, $p < 0.01$) and the possibility that the outcome (DAP journalist) is a virtual certainty. In essence, the large odds ratio implies that there is a notably low probability that one would currently be a DAP journalist without ever having a previous DAP job. The overall model, however, is not significant without some representation of the number of DAP jobs in a journalist’s work history. Furthermore, this variable met the collinearity thresholds, which implies that it is suitable. Indeed, the DAP ratio variable was dominant in the analysis and therefore more variables should be included; however the available data were limited for this present study and as such, this model is a first attempt at understanding the factors that contribute to the likelihood that a journalist is a DAP journalist and requires further fine-tuning.

In addition, the findings in Chapters 5 and 6 are in part based on the collection and analysis of data from an online professional social networking site. Profiles on these social sites are not agreed upon historical record; rather, they are a self-reported
presentation of one’s work and education history. Profiles are voluntary and possibly distorted (Ge et al., 2016); furthermore, data can be easily deleted or changed. In addition, there are different incentives for users to participate on the website, which leads to concerns regarding an unknown sampling frame (Horton & Tambe, 2015). Such limitations can potentially lead to estimation bias; however, prior research suggests such concerns can be mitigated with large sample sizes and correlations with other data sources (Tambe, 2014) as is conducted in this dissertation.

This dataset also has an inherent limitation with regards to longitudinal analysis. The data are less complete with each prior year. This is simply a factor of the way that LinkedIn functions. For example, we have generally complete data on current BuzzFeed employees; however, with each prior year, the picture is less complete. As such, historical references can be used to estimate sample completion. In the case of BuzzFeed during the first year of change (2011), the dataset is about 20% complete. Thus, this method of data collection is limited as far as a snapshot of 2011, but it is also the best picture available of the employment trajectory of DAP journalists and the journalist profession more broadly.

Finally, the assessment of DAP journalists as compared to traditional journalists is grounded in the coding of job titles. While job titles are an important and recognized representation of the responsibilities, knowledge, skills, and abilities an employee is likely to posses, they do not always reflect an employee’s “unique value” (Grant, Berg, & Cable, 2014, p. 1201). These concerns were mitigated with multiple rounds of iterative coding verified through interviews with professional journalists.
Indeed, the data are not perfect. However, the mixed-method approach and the combination of a wide variety of data sources reflecting multiple levels of perspective offers a robust view from which to analyze institutional change. The triangulation of findings further supports a confident assessment of rapid institutional change resulting in institutional augmentation in the journalist profession.

**Future Research**

As the industry continues to evolve, there are a number of avenues for future research in addition to those addressed above with regard to limitations. Building on the concept of institutional augmentation, future research should engage in an explication of this process in action. Specifically, studies should focus on understanding the boundaries and interactions between coexisting institutional structures. An examination of the articulation of daily activities, routines, and responsibilities among DAP journalists coexisting with traditional journalists is but one example. This research would help shed light on any competition or negotiation that might occur as a result of institutional augmentation.

Furthermore, an investigation into the management of institutional augmentation would provide much needed insight into management of institutional change outcomes. This research is perhaps best done with interviews and/or ethnography. It can certainly be applied to understanding change outcomes in a variety of industries.

Lastly, a natural extension of this study is to consider the effects of institutional augmentation on outcomes such as the fates of organizations, individuals, and society at large. For example, future research can engage the cultural implications of institutional augmentation in the journalist profession. Even if DAP journalists serve as a
supplementary form of professional journalists, the cultural consequences are still important. As discussed, any change in the agreed upon understanding of professional journalists can impact the production of news, news organization performance, and public perception. The net effect on the role of news in the public sphere has yet to be determined.

**Conclusion**

This dissertation chronicles recent change in the journalist profession and in doing so, introduces the concept of institutional augmentation as an alternative outcome of rapid institutional change. The research provides a more nuanced understanding of the composition of the journalist profession and a detailed examination of that makeup over time from 2011 through 2016. It is quite clear that the composition of the journalist profession has changed with the increase in prominence and prevalence of data, analytic, and platform professional journalists.

Building on prior literature in institutional change and journalism studies, this research examines the development of DAP journalists. Indeed, rapid institutional change occurred in professional journalists from the introduction of cybergeeks in the newsroom (Nussbaum, 2009) through to the theorization of *news nerds* throughout the industry. The current stage of diffusion helps illuminate the viability of institutional augmentation and the potential for coexistence of both an existing and a new institutional structure.

The dissertation tells a story built from a combination of industry data and interviews with professional journalists to show how DAP journalists—*news nerds*—are quantitatively and qualitatively different from traditional professional journalists. As is evident from this research, however, as rapid institutional progresses, these DAP
journalists have not undergone full institutionalization to the point where they have displaced traditional journalists. Nor have they failed as a fleeting fad. Instead, the institution of professional journalists has augmented to allow for the coexistence of both the old and new forms of professional journalists.

The findings on DAP journalists suggest that institutional augmentation is a powerful explanatory mechanism for understanding the outcome of rapid institutional change. In general, this dissertation offers substantive implications for understanding the process, drivers, and outcomes of institutional change in a rapid context, and specifically regarding change in professional journalists and the development of DAP journalists. It sheds light on rapid institutional change in professions for the news industry and for other industries as well.
Appendix A:

Interview Protocol

PRECEDED BY IRB PROTOCOL: Discussion of IRB policies with interview subject, review IRB release and obtain participant’s signature, discuss recording of interviews and obtain permission to use digital recorder.

Overview
The purpose of this study is to explore the rapidly changing nature of industry-wide strategy and hiring trends within news specifically with regard to the rise in data, analytic, and platform-related such as mobile and social news. Theoretically, this research will help practitioners and researchers alike to understand how organizations respond to rapid and dramatic technological changes. In order to understand how the industry has responded, we will spend this time discussing your broad perspective on trends within the industry over the past five years and then more specifically, the changes in your organization’s priorities in the context of these industry-wide trends.

Introduction
Before we begin, I’d like to learn a little bit more about your role within [INSERT COMPANY]:

- Please describe your role and responsibilities at your company:
- How long have you been working there?

Today’s News Landscape
Next, I’d like to talk about your perspectives on the general news industry. Clearly this is a changing industry and much has been written in the past five or so years about the rise
in new forms of news and news production skills, for example, the rise of social media, data journalism, mobile news.

- The past years have been marked by significant technological change in the news industry. Which new technologies and/or trends have most dramatically changed the nature of the news media business, and how?

**Industry Response**

*Next, I would like to discuss your perspectives on how the industry has responded to these changes*

- In general, how has the industry responded to these changes?
- What major initiatives have you witnessed in the past five years in response to changes in news and news production and consumption?
- Do you see any changes in the types of job roles and corresponding skills required of modern professional journalists? If so, what are some of those job roles and skills?

**Organizational Response**

*Finally, I would like to discuss a little about your organization in particular, within the context of the general news media industry.*

- Does your organization employ journalists with specific data-related roles?
  Analytics/engagement-related roles? Platform/product related roles?
- When did your organization first begin hiring for these types of roles?
- From which industries do you tend to hire these specific types of journalists?
- To whom do technically oriented news media professionals report?
- What types of job opportunities and divisions have been created internally?
• In general, what types of resources (money, personnel, training, etc) are dedicated to the production of data, analytic, platform news?

• To the best of your knowledge, how has this changed over time (specifically over the last five years)?

Conclusion

We’ve covered quite a bit in this discussion; thank you for your time. Before we wrap up is there anything else that you would like to mention?
Appendix B:

Data Verification for Using LinkedIn

Table B1 presents information regarding data verification on collecting employment numbers with LinkedIn compared to other data sources. The number of employees listed was cross-referenced with the CisionPoint database, Pew research reports, and Muck Rack.

Table B-1

<table>
<thead>
<tr>
<th>Data Verification</th>
<th>LinkedIn</th>
<th>CisionPoint</th>
<th>2016 Pew Data</th>
<th>Muck Rack</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABC News</td>
<td>463</td>
<td>201</td>
<td>-</td>
<td>333</td>
</tr>
<tr>
<td>Buzzfeed</td>
<td>194</td>
<td>124</td>
<td>170</td>
<td>270</td>
</tr>
<tr>
<td>CBS News</td>
<td>359</td>
<td>247</td>
<td>-</td>
<td>269</td>
</tr>
<tr>
<td>Daily Beast</td>
<td>42</td>
<td>54</td>
<td>50</td>
<td>62</td>
</tr>
<tr>
<td>Fox News</td>
<td>331</td>
<td>233</td>
<td>1272</td>
<td>241</td>
</tr>
<tr>
<td>Huffington Post</td>
<td>618</td>
<td>159</td>
<td>575</td>
<td>199</td>
</tr>
<tr>
<td>Mic</td>
<td>92</td>
<td>44</td>
<td>13</td>
<td>51</td>
</tr>
<tr>
<td>MSNBC</td>
<td>211</td>
<td>102</td>
<td>600</td>
<td>159</td>
</tr>
<tr>
<td>NBC News</td>
<td>310</td>
<td>220</td>
<td>-</td>
<td>469</td>
</tr>
<tr>
<td>NY Daily News</td>
<td>115</td>
<td>102</td>
<td>-</td>
<td>104</td>
</tr>
<tr>
<td>NY Times</td>
<td>393</td>
<td>659</td>
<td>3588</td>
<td>868</td>
</tr>
<tr>
<td>NowThis</td>
<td>24</td>
<td>5</td>
<td>-</td>
<td>12</td>
</tr>
<tr>
<td>Patch</td>
<td>45</td>
<td>46</td>
<td>50</td>
<td>25</td>
</tr>
<tr>
<td>Slate</td>
<td>30</td>
<td>50</td>
<td>50</td>
<td>61</td>
</tr>
<tr>
<td>Wall Street Journal</td>
<td>360</td>
<td>484</td>
<td>-</td>
<td>908</td>
</tr>
</tbody>
</table>
Appendix C:

Industry and Position Codes

Industry codes include broadcast media, consulting, education, entertainment, finance, government, health, marketing, newspapers, nonprofits, online media, publishing, research, retail, technology, and other.

Position codes include admin, analyst, audience, audio, blogger, broadcaster, camera, consultant, copy editor, copy writer, curator, data, design, developer, development, director, editor, engagement, founder, mobile design, mobile developer, mobile editor, mobile manager, mobile producer, online admin, online analyst, online broadcaster, online camera, online copy editor, online copy writer, online data, online design, online developer, online director, online editor, online engineer, online manager, online operations, online producer, online reporter, online research, online strategy, online writer, operations, platform, producer, product, programmer, reporter, research, social media, strategy, technology, writer, and other.
Appendix D:

Educational Codes for Journalists

Undergraduate majors were grouped into the following 11 categories guided by the National Center for Education Statistics: journalism (including news and media); communication (including advertising and public relations); business (e.g., accounting, finance, management, and economics) information and computer science; other social sciences (e.g., anthropology, sociology, psychology); other humanities (e.g., art history, literature, English); natural sciences (e.g., biology, chemistry, physics); visual and performing arts (e.g., fashion, theater, film); engineering; math and statistics; other.
Appendix E:
Alternative Model for Assessing DAP Journalists

Several classifications of DAP journalists were examined in addition to the one presented throughout this study. An alternative, for example, limited current DAP journalists to data, interactive, graphic, visual, developer, or programmer positions as opposed to also including social media and audience engagement and analytic positions. A binomial regression was performed to test the likelihood that a journalist is a DAP journalist based on this alternative classification. The combination of independent variables utilized remains the same, including: educational degree (undergraduate major), years as a professional (number of years since graduation), prior industry experience (industry of the job immediately proceeding the current news job), diversity of prior industry experience (the number of unique industries in which each employee worked), and the ratio of DAP jobs to total jobs.

The results of this alternative model are also significant. When all independent variables are considered together, they significantly predict whether or not a journalist is a DAP journalist at $\chi^2 = 195.34$, df $= 23$, $p < .001$). The model explains 24% (Nagelkerke’s pseudo $R^2$) of the variance in DAP journalist and correctly classifies 97% of journalists. The results are summarized in Table E1.

According to the results of this alternative model, when all of the variables are considered together, the ratio of DAP jobs to total jobs, prior industry experience in broadcast news, and an undergraduate education in computer science, visual and performing arts, engineering, or math are each significant predictors of DAP journalists.
In other words, the odds of being of DAP journalist are increasingly greater for those with an undergraduate degree in visual and performing arts, computer science, engineering, or math. They are also increasingly greater as the ratio of DAP jobs to total jobs increases and when prior jobs are in broadcast news.

While this alternative model was significant, it only explained 24% of the variance in DAP journalists as compared the model discussed in Chapter 6, which explains 80% of the variance. In keeping with the examination of transformation since the shift to digital—in other words, including the rise of social media and audience analytics—as well as the input from interview subjects, the first model of DAP journalists (as discussed in Chapter 6) was chosen as the most appropriate representation of a new form of professional journalists. The results of the alternative model are provided here as fodder for future discussion and research, as well to illuminate the rigor of the quantitative analyses.
Table E-1

Alternative Model for Logistic Regression Predicting Journalists

<table>
<thead>
<tr>
<th></th>
<th>$B$</th>
<th>$SE$</th>
<th>Odds ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grad. Ed.</td>
<td>-0.55</td>
<td>0.39</td>
<td>0.58</td>
</tr>
<tr>
<td>Grad. Ed. - Journalism</td>
<td>0.88</td>
<td>0.46</td>
<td>2.42</td>
</tr>
<tr>
<td>Years in industry</td>
<td>-0.030</td>
<td>0.02</td>
<td>0.97</td>
</tr>
<tr>
<td>Industry diversity</td>
<td>0.07</td>
<td>0.16</td>
<td>1.07</td>
</tr>
<tr>
<td>DAP jobs / Total jobs</td>
<td>3.72**</td>
<td>0.34</td>
<td>41.06</td>
</tr>
<tr>
<td>Prior - Broadcast</td>
<td>-1.04**</td>
<td>0.32</td>
<td>0.36</td>
</tr>
<tr>
<td>Prior - Digital</td>
<td>-0.41</td>
<td>0.44</td>
<td>0.67</td>
</tr>
<tr>
<td>Prior - Print</td>
<td>0.34</td>
<td>0.30</td>
<td>1.41</td>
</tr>
<tr>
<td>Prior - Technology</td>
<td>0.76</td>
<td>0.56</td>
<td>2.14</td>
</tr>
<tr>
<td>Prior - Entertainment</td>
<td>-18.05</td>
<td>3402.93</td>
<td>0.00</td>
</tr>
<tr>
<td>Prior - Publishing</td>
<td>-0.12</td>
<td>0.49</td>
<td>0.89</td>
</tr>
<tr>
<td>Ed. - Journalism</td>
<td>0.38</td>
<td>0.40</td>
<td>1.47</td>
</tr>
<tr>
<td>Ed. - Communication</td>
<td>-0.74</td>
<td>0.69</td>
<td>0.48</td>
</tr>
<tr>
<td>Ed. - Business</td>
<td>0.88</td>
<td>0.52</td>
<td>2.42</td>
</tr>
<tr>
<td>Ed. - Computer Science</td>
<td>2.02*</td>
<td>0.67</td>
<td>7.51</td>
</tr>
<tr>
<td>Ed. - Social Sciences</td>
<td>-0.11</td>
<td>0.55</td>
<td>0.90</td>
</tr>
<tr>
<td>Ed. - Humanities</td>
<td>-0.27</td>
<td>0.45</td>
<td>0.77</td>
</tr>
<tr>
<td>Ed. - Natural Sciences</td>
<td>1.14</td>
<td>0.71</td>
<td>3.13</td>
</tr>
<tr>
<td>Ed. - Visual Arts</td>
<td>1.00*</td>
<td>0.46</td>
<td>2.72</td>
</tr>
<tr>
<td>Ed. - Engineering</td>
<td>4.04**</td>
<td>1.06</td>
<td>56.97</td>
</tr>
<tr>
<td>Ed. - Math</td>
<td>3.24**</td>
<td>0.96</td>
<td>25.45</td>
</tr>
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($** = p < 0.01; * = p < 0.05$)


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