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ARTICLE



Exploring Public Relations Research Topics and Inter-Cluster Dynamics Through Computational Modeling (2010-2020): A Study Based on Two SSCI Journals

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ABSTRACT

This project addresses the evolution of public relations research over the past decade by examining its two SSCI-indexed journals with methods that can reveal the influence of multiple categories of research clusters. Modeling the full text of all 1,293 published articles in *Public Relations Review* (PRR) and the *Journal of Public Relations Research* (JPRR) from 2010 to 2020 (7,400,685 words), we identified nine non-discrete clusters in public relations research. Using three computational methods – structural topic modeling, inter-cluster network analysis, and network simulation – we found that (1) the strategic management cluster emerged as the most central for the past decade, followed by public relations professionalism, digital media, crisis communication, internal communication, global public relations, rhetoric and philosophy, media relations, and critical studies, ranked by their proportions in the scholarship; (2) JPRR had greater emphasis on the strategic management cluster relative to PRR, which offered a more diverse representation; (3) little longitudinal change occurred throughout the decade, although internal communication gained traction and public relations professionalism and media relations lost ground as the decade progressed; and 4) the last ten years of public relations research did not see intersection among theoretical traditions from different clusters as much as expected, leaving opportunity for more inter-cluster knowledge production. Theoretical and practical implications for the public relations research community are discussed.



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In 2010, Toth described public relations researchers as “a loose confederation of academics who choose to belong to a group, but don’t necessarily subscribe to the same theoretical interests around the phenomena of public relations” (p. 711). The breadth of researcher interests, topics, and methods that self identify as part of this confederation can be both a significant strength of the discipline – in broader multi-methodological expertise, varieties of modes of inquiry, and a larger toolbox to tackle disparate research problems – as well as a liability, in the sense that it can be difficult for all members of the group to easily agree on how to advance the discipline. Topical and methodological divisions can lead to siloed research trajectories as well as make it difficult to define what public relations scholarship is, at its center. To this end, and in this spirit of confederation, we embark on a research journey to apply a series of computational tools to public relations scholarship as a way to more clearly illuminate the connection of terms, topics, and models across all projects in the discipline’s two SSCI-indexed journals—*Public Relations Review* and the *Journal of Public Relations Research*.

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Prior empirical research using bibliometric or network approaches has added significantly to our understanding of what is studied in public relations (e.g., Ki et al., 2019; Pasadeos & Renfro, 1992; Pasadeos et al., 2010) and how researchers connect and cluster (Morehouse & Saffer, 2018, 2019; Page & Capizzo, 2021; S.-Y. Kim et al., 2014). This research frequently seeks to identify paradigms within existing scholarship in an effort to characterize the nature of the discipline or articulate its underlying assumptions. These approaches are based on citations, analysis of abstracts/keywords, and/or manual coding of articles. By contrast, we uncover significant findings that characterize the last decade's public relations scholarship by analyzing published articles' full text (7,400,685 words).

In order to do so, we identify *clusters* of existing scholarship, which are language-driven groupings of topics reflecting similar themes, research areas, theoretical frameworks, and/or methods. While not holistically representative of a true paradigm (Curtin, 2012; Kuhn, 2012), the inherent characteristics of these clusters make them proto-paradigmatic – reflective of multiple aspects that point toward shared researcher mind-set, worldview and goals. In so doing, this research acts as a building block in the path of paradigmatic exploration, providing information regarding existing public relations scholarship to inform future understanding of the paradigm(s) of public relations. To do so, we compute research cluster compositions using structural topic modeling, and investigate the dynamics of inter-cluster knowledge production with network simulation. Similar in public relations scholarly goals to prior paradigmatic research (e.g., Botan, 1993; Toth, 2010) seeking to untangle nuances around both what is studied and how those studies interact, we provide robust evidence for 9 non-discrete clusters of public relations research (in alphabetical order): crisis communication, critical studies, digital media, global public relations, internal communication, media relations, public relations professionalism, rhetoric and philosophy, and strategic management. Second, we show longitudinal changes of those clusters and reveal the differences in emphasis between the two journals. Third, we explore how researchers have combined traditions from distinct clusters in their scholarly writing, and show that inter-cluster knowledge production over the past decade leaves room for growth. The combination of computational methods used in this project, along with the big data approach to textual analysis, allows us to provide a more robust and holistic understanding of the ways in which public relations was studied for the past decade.

We view the findings as evidence of refraction and recommitment to prior approaches. The term *refraction* describes the process of light passing through one medium, then changing speed and direction as it passes through another. For public relations research and researchers, the “medium” of our work is as complex as the ecosystems organizations inhabit: Society evolves, academic expectations and incentives shift, and technology expands, leading researchers in new or renewed directions (Page & Capizzo, 2021). Thus, understanding the evolution of public relations scholarship and what has been described as its clusters and paradigms of research (e.g., Botan & Taylor, 2004; Botan, 1993; Toth, 1992, 2009, 2010; Trujillo & Toth, 1987), must begin by examining the ways in which scholars have refracted or shifted direction, as well as the ways in which they have recommitted to existing research questions, methods, and topics with innovative and intersecting approaches. In light of the findings, we provide theoretical implications as well as practical suggestions for public relations researchers and journal editorial contributors.

Literature review

This project draws from the rich trajectory of paradigmatic research in public relations. Paradigms are related groupings of similarly oriented research, sharing assumptions and often utilizing similar methodologies to answer related, cumulative questions (Botan & Hazleton, 2006; Botan, 1993; Toth, 2010). In this way, paradigmatically engaged research

contributes to the progress of Kuhn's (2012) concept of "normal science." Edwards (2012) characterizes paradigms as "habits of mind" (p. 9), which can be difficult for individuals to be aware of or see beyond. In particular, this research focuses on (1) applying a new methodological approach of topic modeling to review research in public (Song et al., 2020), (2) examining data from the past decade (2010–2020) to build from the six conceptualizations of Toth's (2010) *Reflections on the Field*, and (3) understanding individual articles to be (potentially) indicative of multiple clusters (such as digital media and crisis communication, or internal communication and strategic management). The literature review provides an overview of paradigmatically oriented scholarship as well as prior work attempting to organize research paradigms in public relations. While the authors see significant value in summarizing and relating to this work, the complex nature of paradigms are difficult to define or triangulate through empirical methods. Thus, we use the term *cluster* to represent a group of interconnected and topically aligned research.

Prior paradigmatic scholarship in public relations

Beginning with M. A. Ferguson's (2018, originally presented in 1984) overview of public relations research with a clear paradigmatic vision of relationships, many scholars have taken up the tasks of (a) analyzing and organizing existing scholarship and (b) sorting that scholarship into clusters. This is not a simple or straightforward process, but one laden with challenges and uncertainties. As of 2003, Sallot et al.'s comprehensive study of theory building research in public relations asserted that there was not yet a dominant paradigm, but several productive, generative "arks" (p. 54) based around certain theoretical traditions. Botan and Hazleton (2006) describe such messiness as part of the function and evolution of normal science (see Kuhn, 2012)—as public relations scholars follow existing approaches and methods, then find information that contradicts their existing beliefs. New research questions, concepts, and methods often emerge to build the understanding of the phenomena and accommodate this initially disparate information. This process then creates new paradigms, or perspectives on seeing, understanding, and systematically researching a specific discipline [Table 1](#).

One approach to understanding and organizing research has emerged from a lineage of bibliometric and content analysis studies – beginning with Pasadeos and Renfro (1992)—of systematically examining existing public relations research, particularly its citation patterns and topical choices. This research stream has created a longitudinal picture of public relations scholarship over nearly three decades. In 1992, Pasadeos and Renfro mapped citation trajectories among four public relations journals (*Public Relations Review*, *Journalism Quarterly*, *Public Relations Research & Education*, and *Public Relations Research Annual/Journal of Public Relations Research*) from 1975 to 1989. They note that "periodic studies of citation patterns not only provide a map of publishing activity within a discipline, but also help identify shifts in the relative impact of publications, institutions and schools of thought, as well as linkages among disciplines" (p. 168).

In four studies covering 1975–2015 (Ki et al., 2019; Pasadeos & Renfro, 1992; Pasadeos et al., 1999, 2010), this trajectory of bibliometric research expanded to include additional journals – most recently six: *Journal of Public Relations Research*, *Public Relations Review*, *Journalism & Mass Communication Quarterly*, *International Journal of Strategic Communication*, *Journal of Communication Management*, and *Corporate Communication: An International Journal*. These studies have demonstrated significant growth, development, diversification, and global expansion of public relations research over the past 40 years (Ki et al., 2019; Pasadeos et al., 1999, 2010). Most-researched topics included excellence theory, relationship management, crisis communication, and new technology; while the major research areas (crisis communication, relationship management, communication technology, and dialogue) demonstrated additional integration and connectivity (Ki et al., 2019).

Table 1. Research Review Scholarship in Public Relations

Publications	Topic & Data	Method	Categorization	Central Focus
M. A. Ferguson (2018)	General (1975-1984)	Content analysis	Theories, research areas	Paradigms
Pasados & Renfro (1992)	General (1975-1989)	Content analysis, bibliometric analysis	Method/approach, author (educator, practitioner, student), university affiliation	Citations
Morton & Lin (1995)	General (1975-1993)	Content analysis	Methods, topics (mostly one-topic categories and each defined in text), university affiliation	Citations
Pasados et al. (1999)	General (1990-1995)	Content analysis, bibliometric analysis	Topics of most-cited works (interpreted but not counted), most-cited authors	Citations, citation clusters
Sallot et al. (2003)	General (1975-2000)	Content analysis	Topics (via titles and abstracts), theory development	Theories, paradigms
Pasados et al. (2010)	General (2000-2005)	Content analysis, bibliometric analysis	Categories of research from authors (interpreted and not counted)	Citations
Sisco et al. (2011)	General (2001-2005)	Content analysis	Followed Sallot et al. (2003) coding approach: Identified primary and secondary theories *Categories labeled contained multiple topics	Theories
Ye & Ki (2012)	Online PR research (1992-2009)	Content analysis, bibliometric analysis	Authorship, subjects, methods, theoretical frameworks	Citations
Jain et al. (2014)	Global PR (2006-2011)	Content analysis	Authorship, methods, geographic focus, scholarship type (introspective, practice, theory, contextualized research) *Categories labeled contained multiple topics	Topics, geographic focus
Meadows & Meadows (2014)	General (1975-2013, random sample)	Content analysis	Followed Sallot et al. (2003) coding approach: Topics, methods *Categories labeled contained multiple topics	Theories
Volk (2016)	Measurement (1975-2015)	Content analysis	Topics, theories, methods	Theories
Ki & Ye (2017)	Global PR (2001-2014)	Content analysis, bibliometric analysis, thematic meta-analysis	Topic, method, authorship, country of study, theories	Theories
Morehouse & Saffer (2018)	Dialogue (1976-2017)	Content analysis, network analysis, bibliometric analysis	Research eras, authorship, concepts/topics, theories	Invisible college
Wirz & Zimbres (2018)	Dialogue (1998-2018)	Content analysis, bibliometric analysis	Authorship, dialogic principles represented, empirical and conceptual data, practical and theoretical implications	Dialogic principles
Ki et al (2019)	General (2010-2015)	Content analysis, bibliometric analysis	Authorship, citations, categories by author (interpreted and not counted), concepts/topics	Citations, categories of research
Morehouse & Saffer (2019)	Engagement (2001-2017)	Content analysis, network analysis, bibliometric analysis	Authorship, citations, specialty engagement type, research communities	Invisible college
Ji et al. (2020)	CSR (1980-2018)	Network analysis, bibliometric analysis	Authorship, citations, journals	Invisible college
Morehouse & Saffer (2020)	Engagement (2001-2017)	Content analysis, network analysis, bibliometric analysis	Authorship, citations, concepts/topics, theories, specialty engagement type	Star collaborators
Ki et al. (2021)	Global PR (1983-2021)	Content analysis, bibliometric analysis	Authorship, articles, citations, concepts/topics	Citations

Note: Most previous approaches analyzed concepts, theoretical frameworks, and theories, involving hundreds of academic research articles over multi-year spans and multiple journals, with a systematic process of content analysis involving coders who met inter-coder reliability standards. These methods pushed coders to build discrete categories. In three studies when more than one theme/topic/paradigm was found in an article (Jain et al., 2014; Meadows & Meadows, 2014; Sisco et al., 2011), the authors didn't consider the two working together. Emerging categories contained more than one topic but was not noted as a result of co-theorizing. These categories labels were more likely to produce parsimony. Additionally, some of the citation-based studies discussed topics/research areas of most frequently cited authors or a sampling of articles, rather than a census of all authors and all articles.

More recently, research review studies have focused on specific topics in public relations, including crisis communication (S. Kim et al., 2009), CSR (Ji et al., 2020), digital public relations (Ye & Ki, 2012), dialogue (Morehouse & Saffer, 2018; Wirtz & Zimbres, 2018), engagement (Morehouse & Saffer, 2019), global PR (Jain et al., 2014; Ki & Ye, 2017; Ki et al., 2021), measurement (Volk, 2016), and social media (Wang et al., 2021). They have also incorporated methodological tools such as network analysis (Ji et al., 2020; Morehouse & Saffer, 2018, 2019; S. -Y. Kim et al., 2014) and topic modeling (Song et al., 2020) to more fully analyze available data and understand connections among scholarship and scholars. Multi-methodological approaches have also integrated qualitative and quantitative data to tell more robust, holistic narratives about the evolution and trajectory of public relations scholarship (Page & Capizzo, 2021). This empirical research stands in contrast to the influential (and primarily conceptual) pieces which have understood research topics and paradigmatic differences more holistically.

Paradigmatic categorization

Another important research thread has attempted to synthesize the paradigms in public relations scholarship. Broadly, Broadly, Toth (2009), Edwards (2012) and others have organized public relations scholarship into paradigms that represent or prioritize a constructive or practice-oriented perspective (supporting organizational management, messaging to change awareness, opinion, and behavior, etc.) and those that represent interpretive or critical perspectives (prioritizing the study and critique of public relations as a profession and a culture). Several have proposed new paradigms, including Edwards's (2012) socio-cultural approach and Yang and Saffer's (2019) network perspective. Scholars advocate for the generation of a cohesive, internally consistent body of knowledge for the discipline (e.g., Botan & Hazleton, 2006; M. A. Ferguson, 2018; Toth, 2010) while others make the case to integrate knowledge from external fields or otherwise break and reconfigure existing paradigms (e.g., Curtin, 2012; McKie & Munshi, 2007)—J. E. Grunig and Hickson (1976) do both within the same article.

Practice-oriented or practical paradigms

J. E. Grunig and Hickson's (1976), M. A. Ferguson's (2018), and Hallahan's (1993) paradigmatic contributions tightly connected the value of public relations research and public relations theory to the strategic management of organizations. The goal of this research has been to utilize theory-building, social science research to increase knowledge and understanding of the phenomenon of organizational public relations so that practitioners and organizations can be more effective and ethical (Hallahan, 1993; J. E. Grunig & Hickson, 1976; J. E. Grunig, 2006). In particular, the excellence theory and relationship management perspectives have worked to elevate the management and organizational aspects of the discipline above the communicative and message-centered aspects (J. E. Grunig, 2006; van Ruler, 2016). Hallahan's (1993) approach provided additional detail and separation among professional or practical paradigms, including those organized around public relations processes, planning/programming, behavioral/persuasion, managerial/organizational effectiveness, social problem solving, and systems theory. In each of these interpretations, researchers maintain an obligation to consider the implications of their work on public relations practice (Dozier & Lauzen, 2000).

Interpretive and critical paradigms

By contrast, Trujillo and Toth (1987) presented three paradigms: Functional, interpretive, and critical – making space for approaches that centered communication and meaning, as well as those that critiqued the practices of public relations professionals and researchers. These approaches have included both scholars who have prioritized the communicative aspects of public relations research – such as those working primarily in strategic communication (i.e., Botan & Soto, 1998; Hallahan et al., 2007; Zeffass et al., 2018) or in rhetoric (Botan & Taylor, 2004; Heath, 2006; Waymer & Heath, 2019)—as well as scholars who have brought different varieties of critical and postmodern theories into the mainstream of public relations scholarship (e.g., Ciszek, 2018; Curtin & Gaither, 2005; Holtzhausen, 2013; Toth, 2002; Vardeman-Winter & Tindall, 2010). By separating the aims of public relations research from practice, scholars such as Dozier and

Lauzen (2000) have articulated a clear case for research in public relations that does not and should not feel any obligation to support or improve practice. In this way the intellectual pursuit of public relations knowledge allows space to (1) ask and debate questions about what public relations is and what it should be (Fawkes, 2018) as well as (2) to open the discipline to a wider variety of external perspectives, theories, and philosophies – particularly those outside of the Western and corporate public relations tradition (McKie & Munshi, 2007, 2009). Of course, critical and postmodern theories can provide value for the practice of public relations (Toth, 2002), even though it is not the primary aim of many scholars in this area. In this way, the boundaries between paradigmatic approaches are clearly permeable, and individual researchers or projects may not fit neatly into one or the other of these categories.

Pluralistic approaches to public relations paradigms

While many scholars have argued or advocated for a single or leading paradigmatic approach, others have emphasized the value of a diverse or pluralistic understanding of what can constitute public relations scholarship (Curtin, 2012; Fawkes, 2018; Toth, 2010). In the context of organizational communication research, Putnam (1982) explains that:

each paradigm supplements the other perspectives in building a body of knowledge. Since one alternative provides only a limited view, the existence of multiple and competing paradigms expands our knowledge base. In a dialectical sense, the presence of opposites sustains competing positions and heightens our understanding of each of them. (p. 193)

Such work has emphasized the importance of multiple, healthy research areas – and healthy contention among them – to the continued vitality of the discipline (Page & Capizzo, 2021; Toth, 2009, 2010). In their introduction to *PR Theory II*, Botan and Hazleton (2006) posit that “the field cannot develop further without such a contest of ideas” (p. 4). In this way, many scholars have organized or attempted to generate clusters of shared research interests, sometimes referring to these clusters as paradigms. Table 2 provides a brief overview of some important contributions to this research.

In one widely referenced conception, Toth’s (2010) posited six paradigms (in alphabetical order): crisis communication, critical theory, feminist theory, rhetorical theory, strategic management, and tactical communication (including campaigns). Crisis research encompasses work on image repair and apologia (e.g., Benoit, 1997; Bentley & Ma, 2020; D. P. Ferguson et al., 2018; Len-Ríos et al., 2015; Pratt & Yanada, 2014), situational crisis communication theory (e.g., Claeys & Coombs, 2020; Coombs, 2007; Eaddy & Jin, 2018; Page, 2020), social-mediated crisis communication model (e.g., Austin et al., 2012; Liu et al., 2020), and discourse of renewal (e.g., Ulmer & Sellnow, 2002; Xu, 2018).

Critical theory, including postmodernism, has evolved from Dozier and Lauzen’s (2000) call to extricate research and researchers from the demands or ends of public relations to include work in public relations activism (Ciszek, 2016; Holtzhausen, 2013) and critical/cultural approaches (e.g., Ciszek & Rodriguez, 2020; Curtin & Gaither, 2005; L’etang, 2005; Pal & Dutta, 2008) and a focus on subaltern publics and counterpublics (e.g., Dutta & Elers, 2020; Kennedy & Sommerfeldt, 2015; Munshi et al., 2017; Place et al., 2021).

The feminist paradigm centers research on gender and power in public relations, including the ways in which the shift to a predominately female profession has influenced research and practice (e.g., Aldoory et al., 2008; Fitch, 2020; Toth & Cline, 1991) as well as the broader theoretical contributions from gender and standpoint perspectives (e.g., Aldoory & Toth, 2021; Aldoory, 2005; Golombisky, 2015; L. A. Grunig & Toth, 2006; Vardeman-Winter & Tindall, 2010).

The rhetorical paradigm uses the tools of rhetoric from ancient Greece (Davidson, 2020) to Kenneth Burke (Heath, 2000) in contexts such as shared or co-created meaning among stakeholders (Botan & Hazleton, 2006; Botan & Taylor, 2004) and dialogue (Kent & Taylor, 2021; Lane, 2020; Taylor & Kent, 2014), often with ethical goals, such as a fully functioning society (Heath, 2006) or a longer-term view of organizational success (Kent, 2011).

The strategic management paradigm, often understood in the context of excellence theory and relationship management scholarship (e.g., Hung-Baesecke et al., 2021; J. -N. Kim & Ni, 2010; J. E. Grunig, 2006) and the situational theory of publics/problem solving (e.g., Aldoori, 2001; J. -N. Kim & Grunig, 2011; J. -N. Kim et al., 2008; Krishna, 2021), but also includes the growing area of internal and employee communication (e.g., Lemon, 2019; Men et al., 2020; Y. Lee & Yue, 2020), as well as other approaches to organizational management and decision-making, such as contingency theory (Cancel et al., 1997; Pang et al., 2010, 2021). It encompasses management research focused on specific non-corporate organizations, such as nonprofits (e.g., Harrison, 2018; Pressgrove et al., 2021; Vafeiadis et al., 2021) and governments or government agencies (e.g., Liu & Horsley, 2007; Taylor & Kent, 2016).

Finally, the tactical paradigm includes research on a variety of channels and contexts, including media relations approaches (Waters et al., 2010; Zoch & Molleda, 2006), social media tools (e.g., Davies & Hobbs, 2020; DiStaso et al., 2011; N. Lee et al., 2015), persuasive strategies (e.g., Clementson, 2020; Hobbs, 2020; Werder, 2005), and agenda setting outcomes (e.g., Kiouis et al., 2016; Lan et al., 2020; S. Y. Lee & Riffe, 2017).

The sheer volume of articles published in public relations journals has grown exponentially in the last decade (Page & Capizzo, 2021). This growth includes significant research streams that have emerged or grown significantly since Toth's (2010) taxonomy – such as networks/network analysis (e.g., Sommerfeldt & Kent, 2015; Yang & Saffer, 2019; Yang & Taylor, 2015), LGBTQ research (e.g., Ciszek, 2018, 2020; Place et al., 2021; Tindall & Waters, 2012; Zhou, 2021), and race/ethnicity/racial inequity/intersectionality (e.g., De Moya & Bravo, 2016; Logan, 2011, 2019, 2021; Vardeman & Sebesta, 2020; Vardeman-Winter & Tindall, 2010; Vardeman-Winter, 2011) that provide an opportunity to revisit and reexamine our understanding of clusters and connections among research in public relations.

Challenges for existing approaches

As paradigms are extremely difficult to define empirically, prior paradigmatically oriented research focuses on conceptual models, which tend to prioritize the differences among paradigms and emphasize discrete research topics and methods. By contrast, seeking to understand research areas empirically and apprehend the complexity of their interconnectedness, a research cluster approach looks for language-based similarities. If interaction and contest among paradigms or research clusters is useful/productive/generative (e.g., Botan & Hazleton, 2006; Curtin, 2012; Edwards, 2012; Toth, 2009), shouldn't our approaches to understanding public relations' development trace both the interactions/intersections and the separations/distinctions among and between clusters? We suggest a mind-set that looks more toward a Venn diagram visualization rather than distinct circles of scholarship – interlocking clusters of scholarship rather than wholly separate paradigms.

Rather than a grand paradigmatic contest in the classic model of advancement in the physical sciences (see Botan & Hazleton, 2006; Kuhn, 2012), we follow the mind-set of Martin and Nakayama (1999) who prioritize inter-paradigmatic (or, for our purposes, inter-cluster) dialogue and collaboration in communication research. They begin by acknowledging that most scholars hold and value their paradigmatic roots and training or acculturation, and thus integrative approaches should not be taken lightly. They categorize inter-paradigmatic work as reflective of (a) borrowing – or light use of some theories or concepts from other paradigms in work, (b) multiparadigmatic collaboration – or team-based approaches that actively seek to pair researchers and research skills from multiple paradigms, and (c) a dialectic perspective that values research approaches that bind a discipline across paradigms by focusing on similar questions while holding potentially contradictory truths as simultaneously valuable. Curtin (2012) notes that public relations scholarship “might be more mature than we think if we are willing to accept a diversity of perspectives and their concomitant research values” (p. 31). While Martin and Nakayama (1999) make the case for dialectical approaches as the most generative, multiple forms of inter-cluster integration and collaboration are all demonstrably fruitful in their understanding of knowledge creation within an academic discipline.

Table 2. Typologies of Public Relations Research Paradigms

Publications	Typologies
M. A. Ferguson (2018)	<ul style="list-style-type: none"> • Public relationships • Social issues and issues management • Social responsibility & ethics
Trujillo and Toth (1987)	<ul style="list-style-type: none"> • Critical • Functional • Interpretative (Rhetorical, Cultural)
Toth (1992)	<ul style="list-style-type: none"> • Critical • Rhetorical • Systems
Botan (1993)	<ul style="list-style-type: none"> • Applied • Humanistic/symbolic/persuasive (feminist, rhetorical/critical) • International • Systems/symmetrical/equilibrium • Theoretical (social scientific perspective)
Morton and Lin (1995)	<ul style="list-style-type: none"> • Management • Professionalism • Technical
Dozier and Lauzen (2000)	<ul style="list-style-type: none"> • Intellectual domain • Practice-oriented
Botan and Taylor (2004)	<ul style="list-style-type: none"> • Applied communication research • Co-creational perspective • Functional perspective
Aldoory (2005)	<ul style="list-style-type: none"> • Feminist (power imbalance)
J. E. Grunig (2006)	<ul style="list-style-type: none"> • Strategic management paradigm (cultivating relationships, employee communication, marketing relationships)
Botan and Hazelton (2006)	<ul style="list-style-type: none"> • Excellence/symmetrical • Rhetorical/critical
Toth (2009)	<ul style="list-style-type: none"> • Critical (feminism, postmodernism) • Excellence • Rhetorical (ethics)
McKie and Munshi (2009)	<p>[Augmenting existing lacunae]</p> <ul style="list-style-type: none"> • Environmental & feminist • Political theory & psychology • Othering • Artistic and science-based approaches
Toth (2010)	<ul style="list-style-type: none"> • Crisis communication • Critical • Feminist • Rhetorical • Strategic management • Tactics (media choices, online choices, campaigns)
Edwards and Hodges (2011)	<ul style="list-style-type: none"> • Normative (organization focused) • Socio-cultural
Curtin (2012)	<ul style="list-style-type: none"> • Constructivist • Critical/cultural • Postmodern • Post-positivist
Edwards (2012)	<ul style="list-style-type: none"> • Functional • Non-functional
Fawkes (2018)	<ul style="list-style-type: none"> • Advocacy • Critical • Cultural (driver of promotional culture) • Dialogue • Excellence

Functionally, as paradigms are not necessarily explicit or articulated in published work, it makes them difficult for scholars using bibliometric or content analysis methods to trace. Thus, this study's authors use the term cluster to best represent the paradigm-like groupings of articles with significant topical connectivity uncovered through structural topic modeling, thematic analysis, and inter-cluster network analysis. Content analyses using limited datasets (i.e. title, keyword, abstract) are very helpful for identifying the trends that scholars use in positioning their own work, but do not look deeply at the language and patterns within the articles themselves. Network analysis approaches (e.g., Ji et al., 2020) offer advantages in clearly demonstrating connective clusters of citations, but still do not directly address the holistic sense of what a paradigm reflects – a group of researchers with similar worldviews, interests, and assumptions pursuing similar scholarly questions with similar (or, at least, complementary) tools and methods. In light of these challenges, this paper poses questions best answered through structural topic modeling (STM), which utilizes the full text of articles in the dataset (in contrast to content analysis, keyword/abstract, or citation-based approaches). It also integrates thematic analysis from qualitative research, adding useful multi-methodological perspectives. Therefore, this study advances the research review scholarship in public relations in order to find the evolution and intersection of major research clusters in the discipline. Our study allows for mapping intersections and connections of these clusters within and across articles. The following research questions guided this study:

RQ1: How, if at all, have public relations research topics (2010–2020) clustered together?

RQ2: Between 2010–2020, how have public relations research clusters' proportions differed across journals?

RQ3: How have public relations research clusters intersected with each other in the past decade (RQ3a), and what is the degree of interconnectedness among these existing clusters (RQ3b)?

Method

We believe a more holistic analysis of a field's scholarly knowledge and its evolution has the opportunity to provide unique insights different from analyses of parts of published articles selected by investigators, such as titles, keywords, abstracts, or bibliography, or a selection of papers on a single topic (Song et al., 2020). To build upon the methodological innovations and useful recent reviews of the status of public relations research (e.g., Ji et al., 2020; Ki et al., 2021; Morehouse & Saffer, 2019), we model public relations scholarship based on the complete universe of published articles and use their full text which provides more granularity than prior approaches. Topic modeling begins with the scraping of every article that was published between 2010 and 2020 in *Public Relations Review* (PRR) and the *Journal of Public Relations Research* (JPRR)—the two SSCI-indexed journals focusing on public relations research – in order to find evidence of research clusters and possible significant interactions between them. Including just these two journals over one decade creates an extremely large dataset (more than 7 million words) for analysis. It then includes multiple stages of quantitative and thematic analysis to remove noise and identify research clusters, before performing network analysis and simulation to test robustness of the modeled inter-cluster dynamics.

Data collection

We developed multiple Python scripts to scrape the two journals. Scraping involves collecting every word that was written by public relations scholars in the two leading journals from 2010 to 2020.

Across 55 issues of *PRR* and 46 issues of *JPRR*, we respectively identified 1,132 and 233 articles. By inquiring the *CrossRef* API and inspecting article titles, we deleted 39 and 33 entries that are not usually considered scholarly publications, including acknowledgment of reviewers and editorial boards,¹ book reviews,² editors' prefaces,³ erratum,⁴ and calls for papers.⁵ Our dataset thus contained 1,093 articles from *PRR* and 200 articles from *JPRR*, as well as each article's metadata (e.g., year, authors, keywords, abstract, and number of citations). Most importantly, we collected each article's full text, which amounts to 7,400,685 words in total. We conducted analyses on this textual corpus to discover public relations research's cluster development and inter-cluster dynamics for the past decade with three computational methods: structural topic modeling (including qualitative or thematic analysis), inter-cluster network analysis, and network simulation.

Data analysis

Structural topic modeling

To answer our research questions, we identified topics that emerged from public relations scholars' writing during the past decade. Topic modeling, a dimension reduction method that clusters words into topics based on their co-occurrence, was employed (Roberts et al., 2014, 2019). After noise removal and data cleaning, which encompassed the removal of stopwords, punctuations, symbols, numbers, the phrase of "public relations," and some custom words, we reduced similar words such as "ethical" and "ethics" into a single stem of "ethic" (called "token") and conducted our topic modeling based upon 6,443,910 tokens.

There are many variations for topic modeling. In this article, we specifically employed structural topic modeling (STM), which enabled us to incorporate covariates and examine their impact on topical proportions, a critical methodological advantage over the more traditional Latent Dirichlet allocation (LDA) model (Roberts et al., 2014; Zhou, 2021). We incorporated two covariates: journal and publication year, each tapping into the two journals' different emphases and the field's longitudinal change throughout the years. In the results section, we report the structural topic model with the number of topics set at 65. It should be noted that the number of topics and labels of topics were not chosen by the computer but by the authors. Following best practices for this method (Song et al., 2020; Zhou, 2021), we estimated the number of topics from 20 to 150, and selected 65 considering both model diagnosis (such as semantic coherence and residuals) and qualitative reading.

To perform the qualitative or thematic analysis portion of STM, the four authors then, through multiple meetings, collectively labeled the topics (i.e., the labeling process) and grouped them into clusters in an iterative process reflecting emic and etic approaches informed by the researchers' understanding of public relations scholarship (i.e., the clustering process). This process, which is visible in the online Appendix, was done in a consciously slow, deliberative, and democratic function among the four authors, who represent a diverse cross section of public relations researchers in terms of ontology, research topics, and methodological expertise. During the labeling process, we considered each topic's most frequently recurring words (i.e., frequency) and words that distinguished the topic from other topics (i.e., exclusivity), and gave each topic a descriptive label. For example, a topic with top words such as "twitter," "tweet," and "hashtag" was labeled as "Twitter" by researchers.

During the clustering process, we grouped similar topics into clusters based on our understanding of the public relations research field, while referencing and interpreting the top keywords of each topic. The process reflected best practices for collaborative data reduction and condensation in the mind-set of Miles et al. (2018)—the STM process, in essence, performed the first-cycle coding, and the researchers performed the second-cycle or pattern coding. For example, topics about "SMCC," "SCCT," and "image repair" were clustered together under the "crisis communication" cluster. Additionally, we combined topics that described research methods, such as "interview," "focus groups," and "standard deviations," into a "method" cluster and omitted it from further analyses, since it is not the focus of this research cluster development. We have provided details on our data

cleaning, model estimation, and STM diagnosis in the online Appendix (Figure S1 and S2). We also included the original STM output for reference in the online Appendix (Figure S3).

Structural topic modeling resulted in a matrix that describes each article's research cluster compositions, and demonstrated clear face validity. For example, the paper "Like, comment, and share on Facebook: How each behavior differs from the other" by C. Kim and Yang (2017), the most cited article published by *Public Relations Review* in the past five years according to Google Scholar, was identified to consist of two primary clusters: "digital media" (73.7%) and "strategic management" (18.7%). The "critical studies" cluster was almost undetectable in their writing, landing only 0.01%. We included more examples to show the validity of this computational approach in the online Appendix Table A2. We used two computational methods to build upon this "article X cluster" matrix result: inter-cluster network analysis and network simulation.

Inter-cluster network analysis

To answer our research questions on how research clusters relate to one another and what clusters emerge as central players to the inter-cluster knowledge production of public relations research, we took inspiration from bipartite network projection (Everett & Borgatti, 2013; Melamed & Eriksson, 2014; Zhou, 2019) and devised a new network type.

We considered each article as a combination of research clusters, and treated researchers' inter-cluster writing as a conduit that introduces two clusters to each other and builds relationships between them. For example, C. Kim and Yang (2017), with 73.7% focusing on "digital media" and 18.7% focusing on "strategic management," built a tie weighted as $73.7\% \times 18.7\% = 0.138$ between the two clusters. A more detailed schematic diagram of the method is shown as Figure S4 in the online Appendix.

Therefore, each published article analyzed in our study encompassed a network within itself. We aggregate 1,293 networks/articles to produce an inter-cluster network, which is a fully-connected, weighted, and undirected network where nodes represent research clusters and ties represent strengths of clusters' co-appearance. We analyze this network to identify the key players in the inter-cluster development of public relations research in the past decade. We also use the Gini coefficient to assess the degree of preferential overlap or interconnection between two certain clusters. A Gini coefficient of 0 means that a cluster evenly co-appears with all other clusters, and a Gini coefficient of 1 means that a cluster only co-appears with one specific cluster. Usually, a Gini coefficient higher than 0.4 is considered high inequality (uneven distribution of co-occurrence), and a Gini coefficient lower than 0.2 is considered high equality (even distribution of co-occurrence).

Network simulation

The network derived above is a static and descriptive depiction of how public relations research clusters have intersected with each other in the past decade. It does not, however, inform what role each cluster might have taken in this dynamic process. Neither does it provide numeric estimates on whether researchers in a particular cluster have made extraordinary efforts in bringing various public relations research traditions together.

In implementing a statistical null-hypothesis approach to testing which clusters contribute to inter-cluster knowledge production, we used network simulation to generate null models and compare observations from simulated networks with those from the observed network. We simulated numerous "alternative timelines" where public relations researchers wrote the same amount of work but did not purposely connect or disconnect certain clusters in their scholarly writing. In other words, we modeled all the possibilities of public relations research's landscapes from 2010 to 2020 given two constraints. These two constraints ensure that public relations scholarship's general picture remains the same. The first constraint is that the amount of theoretical development (i.e., the sum of non-methodological clusters' proportions) in each article remains the same. The second constraint is that the amount of theoretical development devoted to each cluster across all articles (i.e., the sum of each cluster's proportion across all 1,293 articles) remains the same. We provided more methodological details on these two constraints in the online Appendix Figure S5.

We employed the *bipartite* package in *R*, specifically its *decimalr2dtable* function, to introduce successive random noises to the “article X cluster” matrix. We simulated 1000 “parallel universes,” built an inter-cluster network for each matrix, calculated these 1000 networks’ tie strengths, and uses the 95%/5% upper/lower bounds of these tie strengths as the confidence intervals to assess whether some clusters’ contributions to inter-cluster knowledge production significantly deviates from null models’ expectations. The simulation code is shown in the online Appendix Figure S6.

In line with the principles of open science, authors have deposited the dataset and analysis scripts on the Open Science Framework for replication purposes.

Results

RQ1: Clusters in Public Relations Research, 2010–2020

Our structural topic modeling and qualitative interpretation among four public relations scholars suggest 9 research clusters that have had a stable presence through the last decade. In this subsection, we describe each of them and present some of the most representative articles for each cluster as examples. Readers may refer to the online Appendix Table S1 for details.

The most prominent research cluster is “strategic management,” taking up 23.7% of what public relations scholars have written in the past decade. Topics in this cluster include “situational theory” (Topic 24), “organization-public relationships” (Topic 31), and “stakeholder theory” (Topic 38). The cluster was evergreen within the dataset, and – as identified in Toth (2009, 2010)—represents the deep connection of public relations research with the function, professional, and organizational purposes of public relations as research, communication, and actions developed to help organizations achieve their goals and strengthen relationships with stakeholders. J. -N. Kim and Ni’s (2013) “Two types of public relations problems and integrating formative and evaluative research: A review of research programs within the behavioral, strategic management paradigm” is among the most representative, with 94.6% of its writing focusing on this cluster.

The second most prominent cluster is “public relations professionalism,” taking up 11.3% of the last decade’s scholarly writing. Topics in this cluster include “PR campaigns” (Topic 23), “PR industry” (Topic 36), and “agency and consulting” (Topic 61). It reflects the deep and ongoing connection between public relations research and the public relations profession, focusing more on individual practitioner experiences, behaviors, and challenges as opposed to the organization-scale center of the strategic management cluster. Yaxley’s (2012) “Exploring the origins of careers in public relations” is among the most representative, with 88.4% of its writing focusing on this cluster.

The third most prominent research cluster is “digital media,” taking up 10.5% of the scholarly volume. Topics in this cluster include “social media” (Topic 4), “Twitter” (Topic 40), “social media engagement” (Topic 52). The continued emergence of digital media and social media platforms is among the most significant changes of public relations practice in the past decade, and our analysis suggests that studies on digital public relations has become one of the top three research areas. Xu and Xiong’s (2020) “Setting socially mediated engagement parameters: A topic modeling and text analytic approach to examining polarized discourses on Gillette’s campaign” is among the most representative, with 76.8% of its writing focusing on this cluster.

The fourth most prominent research cluster is “crisis communication,” taking up 9.78% of public relations scholars’ writing. Topics in this cluster include “SCCT” (Topic 64), “disaster communication” (Topic 35), and “risk communication” (Topic 2). It has been a staple in public relations research over the last decade, providing rich, generative, and practical research questions ranging from corporate reputation and image repair to community preparedness and resilience. S. Kim and Liu’s (2012) “Are all crises opportunities? A comparison of how corporate and government organizations responded to the 2009 flu pandemic” is among the most representative, with 84.3% of its writing focusing on this cluster.

The fifth most prominent research cluster is “internal communication,” taking up 7.16% of the last decade’s public relations scholarship. Topics in this cluster include “employee communication” (Topic 14) and “leadership communication” (Topic 59), among others. This cluster integrates theories from the business management literature and has extended public relations scholarship beyond its previous focus on external public communication. Men et al.’s (2020) “‘Vision, passion, and care:’ The impact of charismatic executive leadership communication on employee trust and support for organizational change” is among the most representative, with 81.8% of its writing focusing on this cluster.

To avoid repetition, we briefly discuss the remaining four research clusters, ranked by their proportions as: global public relations (5.75%, highly representative example: Verčič et al. (2017)), rhetoric and philosophy (5.62%, highly representative example: Kent and Lane (2017)), media relations (5.40%, highly representative example: van der Meer et al. (2014)), and critical studies (5.07%, highly representative example: Ciszek (2018)).

RQ2: Research Cluster Proportion Shift from 2010 to 2020 across Journals

Our next task was to characterize the differences between the two SSCI-indexed public relations journals in terms of their research cluster emphases and the longitudinal changes that have taken place for the last decade. We used nonparametric tests to compare the cluster proportions between articles published in *Public Relations Review* versus the *Journal of Public Relations Research*, and found significant differences but also multiple similarities between the two outlets.

First, two-tailed Mann-Whitney U tests were used to compare the presence of each cluster between the journals. We found that the journals do not differ in their emphasis on the “crisis communication” ($p = 0.221$), “internal communication” ($p = 0.887$), “rhetoric and philosophy” ($p = 0.813$), and “critical studies” ($p = 0.308$) clusters.

Second, we found that research in the *Journal of Public Relations Research* has emphasized the “strategic management” cluster ($M = 0.275, Md = 0.198$) considerably more than *Public Relations Review* ($M = 0.230, Md = 0.155, p < 0.01$). By contrast, research in *Public Relations Review* represents more evenly distributed diversity of clusters, including the “public relations professionalism” (PRR, $M = 0.121, Md = 0.026$; JPRR, $M = 0.072, Md = 0.013; p < 0.01$), “digital media” (PRR, $M = 0.113, Md = 0.024$; JPRR, $M = 0.060, Md = 0.007; p < 0.001$), “global public relations” (PRR, $M = 0.059, Md = 0.005$; JPRR, $M = 0.048, Md = 0.003; p < 0.05$), and “media relations” (PRR, $M = 0.057, Md = 0.007$; JPRR, $M = 0.039, Md = 0.005; p < 0.01$). These differences and similarities are shown with more details in Table 3. These findings were not surprising to the authors, given the perceptions of the two journals by many public relations researchers, which in turn influences what articles are submitted to each one (Page & Capizzo, 2021).

Figure 1 plots the longitudinal changes of journals’ research cluster emphasis through the last decade. In the figure, each dot represents the journal’s average cluster proportions for that specific year. We do not observe significant systematic changes throughout the years; however, the data indicates that “internal communication” is gaining traction while journals have increasingly published fewer studies on “public relations professionalism” and “media relations” over the past decade. Additionally, the *Journal of Public Relations Research* has much more fluctuation each year in terms of emphases, probably due to publishing fewer articles.

RQ3a: Inter-Cluster Knowledge Production

Figure 2 shows the constructed inter-cluster network, with its weighted degree centrality result provided in Table 3 and raw data provided in Table 4.

The strategic management research cluster is the most influential in terms of inter-cluster exposure, occupying the “hub” position in the network. In fact, all eight other clusters’ strongest tie in the

network is the one that they share with strategic management. Assessing the Gini coefficient of these eight clusters' edge weights with other clusters, we identify "media relations" (edge weights Gini = 0.469) and "crisis communication" (edge weights Gini = 0.468) to have the most uneven distribution of inter-cluster attachment, suggesting that these two clusters heavily rely on and draw insights from the strategic management cluster, while rarely intersecting with other clusters. Relatively speaking, the "rhetoric/philosophy" cluster (edge weights Gini = 0.354) and the "global public relations" cluster (edge weights Gini = 0.358) are fairly connected with other clusters (i.e., digital media, critical studies, and professionalism) and facilitated more inter-cluster scholarly exchanges.

Our analysis thus highlights the crucial role of the strategic management research cluster in facilitating inter-cluster scholarship, but also reveals that other research areas are disproportionately dependent on it. It reminds us that the preferential and instinctive attachment to the dominant "hub" cluster might have led public relations scholars to miss potential opportunities to produce innovative work by finding or creating intersections among peripheral clusters. In particular, weak ties exist (1) between "critical studies" and "crisis communication," (2) between "critical studies" and "digital media," (3) between "global public relations" and "rhetoric/philosophy," and (4) between "media relations" and "rhetoric/philosophy." We go to inter-cluster network simulation in the next subsection to statistically test these observations and further our analyses.

RQ3b: *Inter-Cluster Network Simulation*

Confidence intervals in Table 4 show our simulation results. We make the text bold where the observed tie is significantly stronger than simulation and italic where the observed tie is significantly weaker than simulation.

Across all 36 ties, 31 ties are significantly weaker than simulation, indicating that the landscape of public relations research – as we the scholarly community have constructed in the past decade – has much less inter-cluster knowledge production than it could have. In modeling of similar, parallel research universes where scholars randomly combined clusters to answer public relations questions, the amount of co-exposure between two clusters would have been much higher. In other words, the last ten years' public relations research focused on single-cluster development over inter-cluster

Table 3. Cluster differences in journal emphases and the inter-cluster network.

Cluster	Exemplar Article	Proportion (%)	PRR (%)	JPRR (%)	Journal Emphasis Comparison	Weighted Degree Centrality in the Inter-Cluster Network
Strategic Management	J. -N. Kim and Ni (2013)	M = 23.686 Md = 16.462	M = 22.996 Md = 15.517	M = 27.458 Md = 19.848	JPRR > PRR	132.951
Public Relations Professionalism	Yaxley (2012)	M = 11.308 Md = 2.387	M = 12.053 Md = 2.632	M = 7.234 Md = 1.314	PRR > JPRR	68.236
Digital Media	Xu and Xiong (2020)	M = 10.506 Md = 2.128	M = 11.325 Md = 2.409	M = 6.030 Md = 0.683	PRR > JPRR	68.662
Crisis Communication	S. Kim and Liu (2012)	M = 9.776 Md = 7.102	M = 9.771 Md = 0.777	M = 9.804 Md = 0.593	Not Significant	51.989
Internal Communication	Men et al. (2020)	M = 7.156 Md = 2.117	M = 7.043 Md = 2.127	M = 7.774 Md = 2.105	Not Significant	48.544
Global Public Relations	Verčič et al. (2017)	M = 5.745 Md = 5.025	M = 5.927 Md = 0.542	M = 4.753 Md = 0.252	PRR > JPRR	40.804
Rhetoric and Philosophy	Kent and Lane (2017)	M = 5.623 Md = 0.477	M = 5.420 Md = 0.477	M = 6.733 Md = 0.482	Not Significant	38.962
Media Relations	van der Meer et al. (2014)	M = 5.395 Md = 0.647	M = 5.675 Md = 0.685	M = 3.869 Md = 0.463	PRR > JPRR	37.043
Critical Studies	Ciszek (2018)	M = 5.068 Md = 0.182	M = 4.856 Md = 0.193	M = 6.231 Md = 0.130	Not Significant	34.925

Note: Comparison between the two journals are based on the nonparametric two-tailed Mann–Whitney U test..



Figure 1. Journals' cluster emphases throughout the decade.

progress, which further suggests there is opportunity for additional innovative cross-cutting research programs to address these gaps.

Most notable is the “internal communication” cluster, with its eight ties with other clusters all weaker than what is simulated. As a newly emerged cluster, this suggests that articles on internal communication draw theoretical frameworks from internal communication, develop arguments on internal communication, and produce work that only informs future internal communication studies – a reasonable approach to establish a new research area and perspective. But our findings also suggest that the cluster is robust enough to support additional inter-cluster collaboration that could inform new research from perspectives such as rhetoric, critical theory, and global public relations. That said, we recognize that the development of inter-cluster knowledge is a two-way street. The lack of internal communication’s intersection with other public relations research traditions, thus, might also be an opportunity for scholars working in other clusters to draw insights from or discuss their studies’ implications for internal communication.

On the other hand, five ties – between “crisis communication” and “media relations,” between “digital media” and “strategic management,” between “global public relations” and “strategic management,” between “rhetoric/philosophy” and “critical studies,” and between “critical studies” and “public relations professionalism”—are stronger than expected, which suggests that scholarship in these fields has a tendency to intuitively select another specific cluster to intersect with. For example, crisis communication studies often analyze agenda-setting effects of corporate statements, global public relations studies often apply dominant theories from the strategic management cluster to non-Western contexts, and critical studies often critique power imbalance that exists in the public relations industry. These inter-cluster emphases have merits and rationales, but we argue that understanding

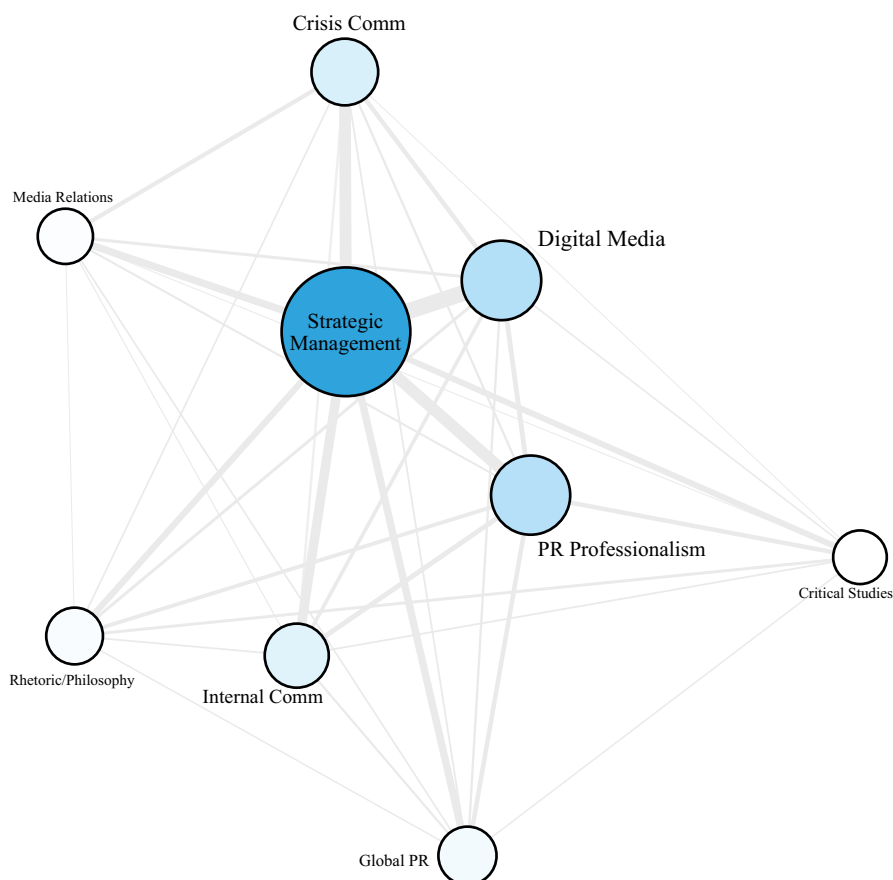


Figure 2. Inter-cluster network of public relations research, 2010–2020.

the gaps opens new avenues for scholarship that could connect these clusters with another rarely-intersected research tradition.

We conclude that inter-cluster development in public relations scholarship is lower than it could be. Relative to modeled universes where public relations scholars randomly combine clusters to address research questions without exhibiting any bias against or for any particular cluster, the inter-cluster development in public relations scholarship has significant room to grow and create new intersections. We see this as an opportunity for scholars from almost all research traditions to draw insights from and provide insights to clusters that are different from their own.

Discussion

By analyzing the full text of all published articles from *Public Relations Review* and the *Journal of Public Relations Research* in the past decade and employing computational methods, we articulated the evolution, orientation, and connectivity among this important subset of public relations research from 2010 to 2020. Our approach, recognizing the fact that one paper can encompass and advance multiple research traditions and perspectives, enabled us to analyze inter-cluster dynamics and reveal previously uncovered patterns of how PR scholarship has developed. While this paper articulates proto-paradigmatic research clusters (rather than advocating for specific, discrete research paradigms), it provides a significant empirical advantage over prior (largely conceptual) studies seeking to map trajectories of research in the field (e.g., Botan & Hazleton, 2006; Curtin, 2012; Toth, 2010).

Table 4. Inter-cluster network adjacency matrix and simulation results.

	Public Relations Professionalism	Digital Media	Crisis Communication	Internal Communication	Global Public Relations	Rhetoric and Philosophy	Media Relations	Critical Studies
Strategic Management	20.549 <i>[26.535, 26.615]</i>	28.031 [25.162, 25.240]	20.493 <i>[23.409, 23.483]</i>	16.518 <i>[18.079, 18.139]</i>	12.960 <i>[14.895, 14.946]</i>	11.071 <i>[14.593, 14.644]</i>	12.801 <i>[14.059, 14.110]</i>	10.528 <i>[13.308, 13.355]</i>
Public Relations Professionalism		8.494 <i>[13.193, 13.244]</i>	4.114 <i>[12.235, 12.286]</i>	8.630 <i>[9.337, 9.377]</i>	7.934 [7.661, 7.696]	6.890 <i>[7.490, 7.523]</i>	3.735 <i>[7.185, 7.218]</i>	7.889 [6.823, 6.855]
Digital Media			7.872 <i>[11.559, 11.607]</i>	6.484 <i>[8.755, 8.793]</i>	4.181 <i>[7.168, 7.200]</i>	5.363 <i>[7.036, 7.068]</i>	5.337 <i>[6.742, 6.774]</i>	2.900 <i>[6.377, 6.406]</i>
Crisis Communication				4.440 <i>[8.144, 8.180]</i>	3.236 <i>[6.648, 6.680]</i>	3.048 <i>[6.521, 6.552]</i>	7.374 [6.293, 6.323]	1.411 <i>[5.910, 5.938]</i>
Internal Communication					4.044 <i>[4.997, 5.022]</i>	3.107 <i>[4.890, 4.915]</i>	2.110 <i>[4.698, 4.723]</i>	3.210 <i>[4.441, 4.464]</i>
Global Public Relations						2.664 <i>[3.981, 4.002]</i>	3.071 <i>[3.832, 3.853]</i>	2.714 <i>[3.612, 3.632]</i>
Rhetoric and Philosophy							1.579 <i>[3.751, 3.772]</i>	5.239 [3.558, 3.579]
Media Relations								1.035 <i>[3.402, 3.421]</i>

Note: Bold text indicates that the observed tie between two clusters is significantly stronger than the simulated parallel universes. Italic text indicates that the observed tie between two clusters is significantly weaker than simulation. The table shows that the landscape of public relations research—as we the scholarly community have constructed in the past decade—has much less inter-cluster knowledge production than what would have been expected. .

Theoretical implications

Combining structural topic modeling results and the research team’s qualitative interpretations, our textual analysis suggests nine clusters of public relations research. We found that the strategic management cluster played a predominant role over the past decade of public relations research. While excellence theory is still present in the dataset with scholars mentioning “excellence” 807 times in the past decade, its theoretical framework has largely been overtaken by the broader umbrella of strategic management (e.g., Fawkes, 2014; J. -N. Kim & Ni, 2010; Toth, 2010)—reflective of many of the same values, but without using the specific language of the excellence study.

Our inter-cluster network analysis suggested that strategic management not only is the most prominent public relations research cluster in terms of volume, but also emerges as the most popular cluster for other research traditions to intersect with. In other words, it is the most central regardless of whether we examine clusters’ sheer sizes or their interconnections. Public relations scholars – whether or not they situate their own studies in the cluster of strategic management – are more than likely to draw insights from it. Our results provide evidence of the establishment of a central practical or practice-oriented cluster in public relations research, whose identity is shared by many scholars (e.g., J. E. Grunig, 2006; van Ruler, 2016). This shared identity, while not surprising for an applied discipline – studying the profession of public relations and the nature, quality, and implications of communication management for organizations – is important for the development of a research discipline and suggests public relations research has matured in the past decade.

The other side of this finding is the implication that public relations scholarship has been, to a certain degree – limited by its reliance and focus on a largely practical strategic management cluster at the expense of other perspectives, such as critical, network, and socio-cultural research (Edwards, 2012; McKie & Munshi, 2009; Toth, 2009; Yang & Saffer, 2019). A management mind-set may limit

the scope of research based on the questions asked, the methods investigated, or the need for practice- or management-oriented outcomes. Practice-oriented or constructive public relations research has been and should continue to be an important contribution of the field, but researchers and journal leaders should reflect on the impact of its centrality and the potentially negative impacts if emphasis on strategic management crowds out other viable areas of scholarship. Thus, the centrality of strategic management necessitates an approach to analysis that allows for the parsing of its interactivity with other research clusters and makes visible potentially understudied and unexamined points of interactivity.

Our network simulation suggests that public relations still has plenty of opportunity to become a more diverse and vigorous field through inter-cluster collaboration. Such collaborations allow scholars to approach known phenomena with new perspectives or methodological tools, and have the potential to spark generative intersections of new scholarship (Martin & Nakayama, 1999). In this dataset, the creation of bridging knowledge and inter-cluster innovations are significantly less than what would have been expected in a modeled world, reducing opportunities for new, pluralistic development (e.g., Curtin, 2012; Toth, 2009, 2010). Scholars may be overly attached to their own research cluster traditions or selectively intersect with the most dominant cluster (i.e., strategic management), without considering the vast possibilities of spanning two peripheral clusters (e.g., between crisis communication and critical studies).

As Martin and Nakayama (1999) suggest, genuinely inter-paradigmatic collaboration is challenging, time-consuming, and may be relatively inefficient for publishing, tenure, and promotion expectations when compared to the work of normal science (Kuhn, 2012). There are clear incentives and logical rationales as to why scholars gravitate toward siloed, incremental work – that often yields clear findings and makes tangible theoretical progress. Additionally, there are clusters reflecting divergent and potentially contradictory epistemologies that may not (or rarely) present viable opportunities for collaboration and integration. Despite these factors, we see inter-cluster collaboration as (1) integral to moving public relations scholarship forward toward greater relevance in the broader social science disciplines such as communication, management, media studies, and (2) beneficial over the long term for participating scholars, who will broaden their knowledge areas, expand their potential research partnerships, and have their work exposed to broader audiences.

There are, of course, many useful, logical, and structurally important reasons for working within a single cluster – what Kuhn's (2012) would call normal science. The act of building, enriching, and investigating a specific phenomena from a specific perspective and with a specific set of methodological tools is necessary and should be valued. Additionally, there are clear situations where paradigms may clash to the degree that true inter-paradigmatic collaboration is not desirable, productive, or even possible. Not every project needs to be integrative, but – in a field as inherently interdisciplinary and practice-oriented as public relations – some current research questions might be addressed more effectively and holistically through such collaborations. And, as incentives are currently stacked against such integration, it benefits scholars to consider its potential.

Botan and Taylor (2004) saw the emergence of a co-creational paradigm as a crucial step forward in public relations theory development, and asked which model from this lineage would move the field forward. They speculated that this theoretical diversity would be a source of strength. They make the case that public relations is valuable broadly within communication and mass communication scholarship as an applied discipline that may be particularly helpful when seeking to better understand the interactions among communities, organizations, and stakeholders regarding social and political issues. As one example, they explore issues management as a particularly valuable theoretical lens for this enterprise – notable for its inter-paradigmatic grounding that combines organizational and management perspectives with rhetorical and deliberative/discursive frameworks. Issues management does not necessarily fit cleanly within one of the nine clusters identified in this study. Precisely for this reason, it may be a model for productive dialectic across subfields (Martin & Nakayama, 1999). Additionally, as with issues

management, a focus on interdisciplinary scholarship within public relations may have the potential to create more theories with the potential travel to other related fields. At the same time, this study demonstrates that there is not yet an answer to Botan and Taylor's (2004) final question about which models would move the field forward: While research has moved away from symmetry and the Excellence Theory, co-creational scholarship and its central concepts have yet to overtake a broader strategic management mind-set in driving public relations scholarship.

Implications for scholars, editors, and reviewers

Journal publications are the result of two concurrent processes, the first concerning what scholars write and the second concerning what editorial teams, reviewers, and various gatekeepers select or encourage. In light of the limited amount of cross-cluster scholarship, we suggest public relations scholars engage researchers with other theoretical or methodological expertise, broaden their horizon of the various approaches to public relations research, and reimagine what theoretical frameworks public relations research can possibly incorporate. We encourage more scholarship that considers and addresses underlying paradigmatic beliefs and looks further for connections rather than remaining siloed (Page & Capizzo, 2021). To start, we should get out of our comfort zones, by reaching out to colleagues that are not considered in our own research "circle," consciously read published articles outside of our substantial areas, and discuss with colleagues that we would not otherwise collaborate with. If we are to achieve greater voice for public relations scholarship, it will be because we have made the most of the different epistemological perspectives that comprise the discipline: This pluralism is our strength.

Additionally, since reviewers may view journal submissions with their own support for specific research clusters and be less open to peripheral views (Page & Capizzo, 2021), we suspect that the editorial process (e.g., submitters' anticipation of reviewer comments) may have also encouraged scholars in less-established clusters to align their work or position their work more closely with the central cluster to improve its reception. The authors thus encourage journal leadership to value and nurture peripheral clusters to provide opportunities for public relations scholarship across the discipline (e.g., Curtin, 2012; Toth, 1992, 2009). After all, public relations scholarship has been invigorated throughout its history by the rich intermingling of research clusters and the ongoing conversation and contestation among different perspectives about what public relations is, as well as what it can be (e.g., Botan & Taylor, 2004; Dozier & Lauzen, 2000; Fawkes, 2018; Toth, 2010). Journal editorial teams (including editors, editorial boards, and reviewers) might consider the composition of submitted articles to help peripheral clusters thrive in order to facilitate the development of multi-cluster and well-rounded public relations scholarship. They can continue to make space for special issues that solicit boundary-breaking studies. In addition, we suggest reviewers keep an open mind and accept review invitations on studies that do not exclusively land on their substantial research areas. As Maureen Taylor described in Page and Capizzo's (2021) reflection piece on *Public Relations Review*, "I think it's really hard for new people to get into the field as well. And I see the reviewers treating pieces on the fringes the same way my work was treated when I was on the fringes. So, it's just a self-perpetuating system" (p. 11).

We recognize that the development of research clusters or theoretical paradigms are usually co-occurring with the adoption of methodological approaches. Therefore, the dominance of some clusters and the lack of inter-cluster innovation might also be reflecting the field's overemphasis on quantitative methods (Gower, 2006; McKie & Munshi, 2007). This methodological preference, as well as the expansion of additional publication outlets over the past decade, might have contributed to the two journals' loss of volume in terms of, for example, critical studies and global public relations.

If we are to achieve greater voice in the academy for public relations scholarship, it will be because we have overcome the missed opportunities for connection evident in this study. While we certainly see areas of refraction and change – such as the expansion of internal communication scholarship and

the decrease in media relations research, these data also provide clear evidence of scholarly recommitment to a central and influential strategic management perspective in public relations scholarship. We achieve more through interconnectedness – by working together across clusters and having a degree of consensus in our worldviews and purposes, even amid a variety of epistemological perspectives and methods of gleaning this knowledge (e.g., Sallot et al., 2003; Toth, 2010). The work of normal science, replication, and generating valid and robust social science and insightful humanities-driven scholarship is crucial to the continued health of the public relations discipline. Yet, there are so many incentives for scholars, journal editors, and peer reviewers to reinforce the presumed, sometimes unspoken boundaries of existing paradigms that inter-paradigmatic approaches are often under-supported and underdeveloped. With the available data in this study, it necessitates a conscious effort to understand where the potential intersections among research clusters may provide generative new directions.

Limitations and future research directions

While this article provides additional data, advanced methodological approaches, and a recent dataset that have not been explored in prior scholarship, it is limited by several important factors. First, by selecting only the two public relations-oriented SSCI journals, it does not capture the full scope of diversity in the discipline. Thus, the resulting research clusters and overall implications are truly bounded by the journal sample – and the authors believe that, while it is an important sample, it is not a neutral or representative sample indicative of the full scope of public relations research. For example, *Public Relations Inquiry*, the *Journal of Public Interest Communications*, and the *International Journal of Strategic Communication* (to name just a few) provide perspectives that highlight postmodern and critical scholarship, nonprofit and pro-social communication, and global public relations and strategic communication more centrally than in the two journals studied. While the *Journal of Public Relations Research* and *Public Relations Review* are indisputably important, established, and leading journals, they are increasingly less central to all of public relations' scholarly conversations. In particular, we see the founding of *Public Relations Inquiry* in 2012 as creating a highly valuable space for critical scholars – but one that has also relocated research that may have otherwise been published in the two SSCI-indexed journals. Scholarly books and edited volumes such as the multiple volumes of *Public Relations Theory*, *The SAGE Handbook of Public Relations*, and *Rhetorical and Critical Approaches to Public Relations* also provide vital space for paradigmatic development (Page & Capizzo, 2021; Sallot et al., 2003). Thus a critical cluster may appear smaller in this dataset than it is for the discipline because it is found outside the most heavily read and cited public relations journals, and our results are most likely slightly over-representative of strategic management's centrality. Additionally, while the deliberative and transparent nature of the data reduction (clustering) process followed best practices and included researchers with multiple research areas and methodological perspectives, those researchers are all U.S. based and may carry their own internalized research priority and epistemological biases into this work.

Future research will need to include additional journals as well as provide longitudinal perspectives relative to these results. It also provides an opportunity to dive deeper into the existing dataset to focus on specific clusters and sub-clusters within this broader canvas of scholarship in two top journals.

Conclusion

Even with these limitations, the combination of topic modeling and network analysis provides us with a clear, comprehensive representation of everything public relations scholars have written from 2010 to 2020 in two leading journals. This complete dataset with our analytical approach advances our understanding of the connections and interactions (and lack thereof) for individual research trajectories and the field as a whole. It illuminates areas of both refraction and recommitment for public relations researchers. In the broader contexts of communication, management, and mass

communication research and practice, our paper serves as a starting point toward a new discourse of convergence and integration. Just as in public relations practice, the discipline has grown over the past decade to encompass more research in (or overlapping with) advertising, big data, marketing, and social media. As multiple scholars approach similar phenomena from different epistemological perspectives, structural topic modeling will continue to allow accurate parsing of proto-paradigmatic indicators while maintaining the crucial knowledge that these research clusters overlap and support each other. In the discipline of public relations, the foothold of the strategic management cluster is most likely reinforced by departmental-level interests (teaching needs), funder interests (organizations seeking applied research), as well as the number of researchers with practitioner experience. As Toth's (2010) notes, new and paradigmatically generative research questions are likely to come from new generations of scholars without professional experience or industry ties. While there are circumstances of institutional constraints and trends of "hot topic" research areas, this study encourages scholars to stretch their work to continue to build cross-cluster connections for the public relations body of knowledge – for the practice and to strengthen its place in the academy.

Notes

1. e.g., <https://doi.org/10.1016/j.pubrev.2020.101898>.
2. e.g., <https://doi.org/10.1016/j.pubrev.2016.02.004>.
3. e.g., <https://doi.org/10.1080/1062726X.2016.1191225>.
4. e.g., <https://doi.org/10.1080/1062726X.2015.1060841>.
5. e.g., <https://doi.org/10.1080/1062726X.2014.947230>.




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