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Finding the path beyond reputation repair: A structural topic modeling analysis of the crisis communication paradigm in public relations☆

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A B S T R A C T

This research utilizes computational methods to examine crisis communication scholarship from 2010 to 2020 in two studies with a census of all articles in *Public Relations Review* and the *Journal of Public Relations Research* (n = 1293 articles, 7400,685 words). Results indicate crisis scholarship has expanded beyond its prior focus on reputation repair. Situational crisis communication theory and image repair are compared in volume of scholarship and methodological affinity. Social media, SCCT, and media relations are identified as central topics within crisis communication scholarship.

Crisis communication scholarship within public relations has grown from a very small piece of nascent scholarship in the last quarter of the 20th Century to become a paradigm of the discipline (Toth, 2010). In its early days, public relations crisis research emphasized image and reputation repair (Liu & Fraustino, 2014). Indeed, the first known bibliometric analysis of crisis communication scholarship (Avery et al., 2010) focused exclusively on the two dominant reputation repair theories: image repair theory (IRT) and situational crisis communication theory (SCCT). This preoccupation with reputation has been criticized as scholars have called for more research into other aspects of crisis communication (Liu & Fraustino, 2014; Sellnow & Seeger, 2021). As crisis scholarship within public relations has grown, researchers have added a diversity of epistemological, ontological, and axiological perspectives, as well as a wider range of methodological tools. This has included a shift beyond the reputational focus on organizational outcomes and toward community and societal perspectives (e.g., Liu et al., 2020; Waymer & Heath, 2007). It has also followed the growth of increasingly sophisticated quantitative approaches (Zhou et al., 2023; Page & Capizzo, 2021), allowing for more nuanced experimental design approaches, as well as better access to big data and network analysis in understanding crisis phenomena.

This research seeks to update existing knowledge on the state of crisis communication research within public relations scholarship. Recognizing that the public relations research has grown significantly since

2010 with new ideas and a large number of new scholars (Page & Capizzo, 2021), it examines trends in reputation repair scholarship to see how they have changed since the prior bibliometric analysis (Avery et al., 2010). It compares the patterns of IRT and SCCT scholarship, while also testing the degree to which crisis communication research has moved beyond reputation repair scholarship and into new areas. To do so, this research utilizes a comprehensive, full-text approach to examine how different areas of crisis communication scholarship interact with different clusters of public relations research identified by Zhou et al. (2023).

Using structural topic modeling (STM) and bipartite network analysis, this research models every word published in *Public Relations Review* and the *Journal of Public Relations Research* between 2010 and 2020, uses signals from term co-occurrence to facilitate dimension reduction, and clusters together central research topics, revealing how public relations scholarship on crisis communication has evolved in the past decade. Our approach allows for analysis of the growth of the paradigm against the findings of the prior bibliometric analysis (Avery et al., 2010) and suggestions from scholars (Liu & Fraustino, 2014) with a new and more robust dataset. Additionally, this approach allows for analysis of which methods are used in conjunction with different topics within crisis communication scholarship and how those topics interact with various non-crisis clusters of public relations research.

Based upon these initial findings, a second study is conducted in

which the sample is limited to studies focused on crisis communication. This further step allows us to explore the paradigm in more nuance, identifies several more topics in crisis communication scholarship, and compares their growth from 2010 to 2020. This analysis finds that crisis scholarship has broadened to include non-reputation topics, largely following the paths set forth by Liu and Fraustino (2014) of research into social media and resilience. Further, this study finds the volume of reputation research using SCCT has grown significantly and remains largely quantitative, while the volume of research using IRT is declining as a percentage of crisis scholarship and remains predominantly rhetorical. Finally, social media, SCCT, and media relations are identified as central topics within crisis communication scholarship. Implications for future research and theory development in public relations and crisis communication are discussed.

1. Literature review

Across the social sciences, the volume of scholarship has grown significantly over the last several decades, and technology has evolved to allow for processing and interpreting trends within it (Sinkovics, 2016; Small, 2003; van Raan, 2001). Bibliometric analysis is the traditional tool for such analyses (Narin, 1976). Faced with the impossibility of any individual processing every detail in every article on a given subject in a systematic way, bibliometric analysis enables academic librarians, historians of science, and other scholars doing research review work to use citation patterns between articles to identify linkages in ideas (Borgman & Furner, 2002; Narin, 1976; van Raan, 2005). This method has produced significant knowledge and understanding about the growth of science in various fields.

Bibliometric analysis has been used in public relations to identify key scholars and key publications influencing the discipline's growth (Ki et al., 2019; Pasadeos et al., 1999, 2010). Further, bibliometric analysis has been used to examine the sources from which existing public relations research draws knowledge (Page & Capizzo, 2021; Pasadeos et al., 1999). The most prominent research trajectory in this vein has generated laudable longitudinal data in a series of studies beginning in 1992 with Pasadeos and Renfro (covering four public relations journals from 1975 to 1989) and continuing in five-year or six-year data increments through 2015 (Ki et al., 2019), expanding to include six public relations journals.[1] These articles have traced the increased citation density within public relations work, as opposed to other social science disciplines (Pasadeos & Renfro, 1992). They found significant increases in the number of academic-authored articles, as well as the growth of specific topics, such as technology and crisis communication (Pasadeos et al., 1999, 2010). All of these projects have focused on general public relations journals and have excluded niche public relations journals that focus on specific topics (e.g., *Asia Pacific Public Relations Journal, Journal of International Crisis and Risk Communication Research, Journal of Contingencies and Crisis Management,* or *Journal of Public Relations Education*) or epistemology (e.g., *Public Relations Inquiry*). Bibliometric analysis can be done with simple citation counts and authorship totals, but research has become more sophisticated by adding the ability to construct a network analysis.

More recent articles have utilized network analysis, enabling scholars to identify the connections between authors and their ideas by mapping citations, thereby illuminating the invisible college in distinct topical areas (e.g., Morehouse & Saffer, 2018; 2019). More recently, research trend scholarship has often narrowed its focus to specific topics such as dialogue (Morehouse & Saffer, 2018; Wirtz & Zimbres, 2018),

digital public relations (Huang et al., 2017; Ye & Ki, 2012), crisis communication (Kim et al., 2009), internal communication (Lee & Yue, 2020), and measurement (Volk, 2016). Understanding the connections between scholars can provide readers with a roadmap to study a discipline of scholarship. Several studies have used this method to illuminate public relations scholarship either as a whole or in specific segments (e. g., Ki et al., 2019; Morehouse & Saffer, 2018, 2019; Page & Capizzo, 2021, Pasadeos et al., 2010). These approaches provide a rich understanding of public relations scholarship, but they also are limited by their reliance on citation patterns. That is, they find connections within authors and citations, which can hide connections that are uncited or where ideas and language are similar but citations are not included. Increasingly, new methodological approaches offer a potential remedy and can detect patterns in language that may illuminate connections overlooked or overemphasized by citations alone.

STM provides an opportunity to add depth by analyzing every word of publications in order to find language patterns and topics within scholarship. This approach has been used in communication scholarship (Song et al., 2020). In the case of public relations, the first known STM study for research review has made the case for nine non-discrete clusters of public relations scholarship (Zhou et al., 2023).

1.1. Paradigms of public relations

Over the past forty years, multiple scholars have postulated different paradigmatic breakdowns under the umbrella of public relations research. Paradigms may be understood as "schools of thought" (Fawkes, 2018) or shared areas of systematic scholarly inquiry (Botan & Hazleton, 2006; Kuhn, 2012) as well as the associated "habits of mind" for researchers that may be difficult to break (Edwards, 2012, p. 8). Mary Ann Ferguson (2018) presented relationship management alongside public relations education, history, professionalism, issues management, and program or campaign implementation as central areas or topics of study in the discipline at that time. Trujillo and Toth (1987) classified research in public relations into three paradigms: functional, interpretive, and critical—reflecting the addition of emerging research areas not centered on achieving organizational goals. This turn was most clearly articulated by Dozier and Lauzen (2000) as the project to liberate public relations research from the goals and ends of public relations practice. By the 2000s, the growth in the volume and depth of public relations research drove additional paradigmatic articulation (Botan & Taylor, 2004; Botan & Hazleton, 2006; Toth, 2009). Botan and Hazleton (2006) note that paradigms have three levels: (1) *metaphysical* or the seldom-discussed frameworks of research, (2) *disciplinary matrix* or the actions, practices, and assumptions of researchers working within the bounds of "normal science" in a paradigm, and (3) *exemplars* or the details of a particular paradigm such as the survey questions, measurement tools, and experimental manipulations (see also Kuhn, 2012; Masterman, 1970). More recent typologies include Toth's (2010) six paradigms (in alphabetical order: crisis communication, critical, feminist, strategic management, rhetorical, and tactical), Edwards' (2012) understanding of functional (or organizationally centered) vs. non-functional scholarship (looking within organizations and beyond their bounds and ends to critique the practice and profession of public relations in society), and Fawkes' (2018) typology of excellence, advocacy, dialogue, and critical/cultural perspectives.

We base this study on an understanding of public relations scholarship articulated by Zhou et al. (2023) on groups of public relations

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[1] As noted by Ki and colleagues (2019) these are the three original journals (*Journal of Public Relations Research, Journalism & Mass Communication Quarterly,* and *Public Relations Review*) and three newer journals (*Corporate Communication, Journal of Communication Management,* and *International Journal of Strategic Communication*).

scholarship they termed clusters.[2] These authors used STM with a census of articles in *Public Relations Review* and the *Journal of Public Relations Research* between 2010 and 2020 and identified nine different clusters of public relations scholarship: critical, crisis, digital, global, internal, management, media relations, professional, and rhetorical. The study used the full text of all articles and a multi-stage, multi-methodological analysis approach to identify and collapse themes. This resulted in a holistic understanding of (1) the central topics and concepts studied in public relations scholarship (in two SSCI journals) and (2) for the first time, the ability to empirically assess the overlap and intersection of the clusters studied.

This innovation allowed the scholars to examine which areas of public relations scholarship have worked together, and which still have the opportunity to increase this inter-paradigmatic knowledge production. Informed by Martin and Nakayama (1999), this approach sees ongoing collaboration and connectivity as central to generative research in communication. For many public relations scholars, this ongoing contest among paradigms is crucial to development (e.g., Botan & Hazleton, 2006; Edwards, 2012; Toth, 2010). Botan and Hazleton (2006) speak to this significant common thread—the value in a multi-paradigmatic discipline of public relations research:

> It is our belief that communication, like other social sciences, is naturally polyparadigmatic. That is, we think communication is best characterized by numerous competing paradigms, particularly at the construct and matrix levels, and not by the kinds of laws the natural sciences seek. (p. 8)

Also, important to recognize is that these clusters are not discrete, but often combine and overlap with each other (Zhou et al., 2023). Thus, public relations scholarship, like many fields and disciplines of social science, benefits both from contest among paradigms (e.g., Botan, 1993; Botan & Hazleton, 2006; Edwards, 2012; Curtin, 2012; Toth, 1992, 2009), and inter-paradigmatic collaboration (Martin & Nakayama, 1999). Zhou et al. (2023) found that scholarship in public relations between 2010 and 2020 has strong multi-cluster depth, but that strategic management scholarship is still at the center of knowledge creation, and that there is still opportunity for increased inter-cluster collaboration. Additionally, the study suggested that many of the structural processes of scholarship may drive a seeming retrenchment in existing topics and clusters of scholarship—and that journal editors and reviewers have an opportunity and obligation to cultivate and encourage inter-cluster, collaborative, and critical scholarship that may sit outside of a strategic management or functional framework. In this research, we seek to explore in greater depth the crisis communication paradigm as identified by Zhou et al. (2023) and examine how it connects with other research clusters.

1.2. Crisis communication

Crisis communication scholarship, the center of this project, often reflects a strategic management perspective in supporting organizational outcomes, such as bolstering reputation (e.g., Benoit, 1997; Claeys & Coombs, 2020; Eaddy & Jin, 2018; D. Ferguson et al., 2018; Ma & Zhan, 2016) or achieving community-centered goals such as public safety (e.g., Jin et al., 2021; Liu et al., 2018; Seeger, 2006; Veil & Husted, 2012; Veil et al., 2020), but can also reflect rhetorical and critical perspectives with distinct paradigmatic assumptions, as in discourse of renewal scholarship (e.g., Lambiase & English, 2021; Sellnow et al.,

2019; Ulmer & Sellnow, 2002; Xu, 2018). Thus, while organizational ends may be a default position in understanding crisis phenomena—one may reasonably ask: a crisis for whom? (Kent, 2010)—scholars from a variety of epistemological and ontological perspectives have made significant contributions to crisis communication in public relations. This rich, generative diversity within the growing crisis communication paradigm (Avery et al., 2010; Page & Capizzo, 2021; Wang & Dong, 2017) speaks to the need for additional sub-paradigmatic articulation of the topics within crisis communication scholarship. The traditional tool for such analyses is bibliometric analysis.

The first known bibliometric study of crisis communication in public relations scholarship was published in 2010 (Avery et al.). Reflecting the emphasis on reputation repair scholarship up to that time, the study focused exclusively on comparing IRT and SCCT, reporting on 66 published articles from 1991 to 2009. The study found more research grounded in IRT than SCCT. However, it found that SCCT research was increasing in volume while IRT research was being published at a fairly constant rate. In addition, the study found IRT was mostly rhetorical (24 out of 29 studies were rhetorical in nature), while SCCT largely used experiments (nine out of 15 studies were experiments). They also found that rhetorical methods were the most used in this sample of crisis communication scholarship, followed by experimental, and then qualitative.

A more recent bibliometric analysis examined crisis communication within the context of sport. Harker and Saffer (2018) used a network perspective to determine influential authors and theories. They found wide use of SCCT and IRT. Further, they identified a strong emphasis on applied and critical-cultural scholarship. The authors suggested sizable opportunities existed for growth in empirical scholarship.

Responding to the perceived heavy emphasis on reputation repair, Liu and Fraustino (2014) reviewed the theories used in crisis communication scholarship, grouping them into reputation repair,[3] complexity-understanding, and resilience-generating theories. They proposed a new area of study in social media as well. Reputation repair consisted of IRT and SCCT. Complexity understanding theories included chaos theory and complexity theory (e.g., Gilpin & Murphy, 2006). Discourse of renewal was identified as the key resilience generating theory. Finally, the social-mediated crisis communication model (SMCC) and networked crisis communication theory were identified as potential paths forward for social media scholarship in crisis public relations. The authors concluded by suggesting scholars "move beyond predominantly focusing on image management" (p. 545).

Liu and Viens (2020) provided additional guidance on gaps in crisis scholarship based upon their experiences as editor and editorial assistant of the *Journal of International Crisis and Risk Communication Research*. In addition to calling for research about the practice of crisis communication, these scholars suggested more theory-driven research into public perspectives of crisis and interpersonal theories of communication. Specifically, they noted that crises influence "real people, properties, and livelihoods" (p. 8) and so extend beyond traditional analyses of corporations, governments, and nonprofit organizations. Notably, this call again pushed away from reputation repair scholarship. Sellnow and Seeger (2021) also emphasized non-reputation repair scholarship and perspectives with their book, *Theorizing Crisis Communication*.

Applying the method of STM (i.e. Song et al., 2020), we examine the crisis communication paradigm within public relations scholarship in depth. In particular, drawing from prior scholarship (e.g., Liu & Fraustino, 2014; Liu & Viens, 2020; Sellnow & Seeger, 2021), we are interested in the differences between reputation repair scholarship and non-reputation repair scholarship as well as comparisons between SCCT and IRT. Where possible, we hypothesize the trends discovered by

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[2] While some of these groups, such as crisis, reflect paradigms articulated by the aforementioned scholarship, the authors used the term cluster as some of the groups might not reach the lofty level of "paradigm". In this research, we claim that crisis is definitely a paradigm as explained by Toth (2010). Therefore, we will refer to it as a paradigm, while using the term cluster to describe the findings of Zhou et al. (2023) regarding the other areas.

[3] They used the phrase "image-making". For the sake of consistency, we use the term reputation repair throughout this study.

Avery and colleagues (2010) will continue. We further examine the responses to the call from Liu and Fraustino (2014). Therefore:

RQ1. What percentage of public relations scholarship is within the crisis communication paradigm?

RQ2. (a) How do IRT and SCCT compare in connections to other paradigms? (b) Have these patterns changed over time?

RQ3. (a) What topics of crisis communication scholarship exist beyond reputation repair? (b) What are their relative volumes? (c) Has the relative volume of the topics of crisis scholarship changed between 2010 and 2020?

H1. (a) IRT will take up a larger proportion of scholarship than SCCT. (b) SCCT research will increase in quantity over time. (c) IRT will stay at a consistent quantity over time. (d) SCCT will use quantitative methods more than qualitative methods, rhetorical methods, or network analysis. (e) IRT will use rhetorical methods more than quantitative methods, qualitative methods, or network analysis.

2. Method 1

To provide for our holistic approach to examining public relations scholarship, we collected a census of public relations scholarship published in the field's two SSCI-indexed journals from 2010 to 2020. We started by scraping all 1293 articles published by *Public Relations Review (PRR)* and the *Journal of Public Relations Research (JPRR)* during the time period, which amounted to 7,400,685 words.

2.1. Creation of topics & paradigms

After data cleaning such as the deletion of URLs, stopwords, and the common phrase of "public relations," we conducted STM on the textual corpus and identified 65 topics (with one filler topic) based on the model diagnosis' semantic coherence and residual level, with our raw data output shown as Table 1 and Figure 1, 2, and 3 of the Appendix. STM clusters words together into topics based on their co-appearance within and across documents but does not automatically label these topics. Topic labels with substantial meaning require human interpretation and domain knowledge (Roberts et al., 2014; Song et al., 2020; Zhou, 2021). A team of four public relations scholars conducted several rounds of meetings to label and cluster relevant topics together to identify major research clusters in public relations scholarship—consisting of (in order of volume, greatest to least) strategic management, public relations profession, digital media, crisis communication, internal communication, global public relations, rhetoric and philosophy, media relations, and critical studies—which is detailed in Zhou et al. (2023).

In other words, we used an unsupervised machine learning method to identify groupings of words within the dataset. The method gave us 65 groups of words that it could tell were related. We then had a team of four experts in public relations scholarship identify the meaning of those groups of terms with short labels that included research topics and methods (e.g., SCCT, IRT, regression). These groups are called "topics" as the method's name ("topic modeling") entails. Following this first analysis, the experts then clustered the topics into nine coherent clusters of public relations scholarship. This method is informed by and consistent with prior studies such as Song et al. (2020) and Zhou (2021).

2.2. Examples demonstrating validity of analysis

This full-text structural-topic-modeling approach proves to be highly accurate at detecting cluster compositions in academic writing. For example, Jin and Liu (2010, "The blog-mediated crisis communication model: Recommendations for responding to influential external blogs") was detected to have 63.6% of its writing on crisis communication, 10.7% on digital media, and 0.007% (barely detectable) on critical studies. More examples can be found in Table 2 of the Appendix.

Similarly, the method is also effective at distinguishing within a cluster at the topic level. Under the umbrella cluster of crisis communication, we identified 7 topics based on the modeling of all 1293 published articles. The topics were (in alphabetical order) disaster communication, emotion, image repair, post-crisis management, risk/SMCC, rumors, and SCCT. Our methodological approach distinguished crisis communication papers from each other, based on their various topical emphases, as well as demonstrated their overlap and intersection. For example, if we compare two crisis communication papers—Jin et al. (2014, "Scale development for measuring publics' emotions in organizational crises") and Waters (2013, "Tracing the impact of media relations and television coverage on U.S. charitable relief fundraising: An application of agenda-setting theory across three natural disasters"), STM results and thematic clustering suggested that the Jin et al. (2014) paper emphasized more on "crisis emotions" (Topic 12, proportion: 52.7%) than "disaster communication" (Topic 35, proportion: 1.1%), while the Waters (2013) paper emphasized more on "disaster communication" (Topic 35, proportion: 37.2%) than "crisis emotions" (Topic 12, proportion: 9.3e-05, barely detectable). Additional examples are provided in Table 3 of the Appendix.

2.3. Topic areas used for comparisons

SCCT (Topic 64) and IRT (Topic 45) were identified as their own topic areas, allowing us to make direct comparisons between the two theories (e.g., Avery et al., 2010). This included methodological affinity of the theories (explained in the next subsection). Our STM model detected four clusters of method-related terms: (1) Quantitative methods included topics such as regression, structural equation modeling, and factor analysis (Topics 7, 34, and 48 respectively). (2) Qualitative methods included topics such as interviews and ethnography (Topics 25 and 60 respectively). (3) Rhetorical methods included a single topic with terms such as "rhetoric" and "discourse" (Topic 8). (4) Network analysis was one topic with terms such as "network," "node," and "tie" (Topic 47).

2.4. Affinity explained

An important goal of the study was to quantify how clusters, topics, and methods exhibit preferential attachment to other clusters, topics, and methods. For instance, we are interested in how SCCT shows a different preference to either quantitative or qualitative methods. However, this measure needs to be controlled for the relative volume of scholarship, so that two large groups that barely interact do not appear to be interacting as much as two small groups that interact quite significantly.

To address this concern, we constructed a new measure named "affinity," defined as one cluster/topic/method's (as the source) preferential attachment to another cluster/topic/method (as the destination), and quantified it as the amount of co-exposure between the two clusters/topics/methods divided by the destination group's average proportion across scholarship. Affinities should be understood in terms of their size relative to other similar affinities, with higher affinity indicating more intentions of source groups to interact with destination groups. For example, as all 1293 articles' SCCT-Quantitative co-exposure adds up to 0.0218, we divide this number by quantitative methods' writing proportion across public relations scholarship (7%) and get $0.0218/0.07 = 0.31$ as "SCCT's affinity to quantitative methods." By comparing this number with SCCT's affinities to other methods, we are able to reveal the methodological preferences exhibited by crisis communication scholarship's research topics. We can also calculate crisis communication research topics' affinities towards other research topics and clusters, using the same logic. We suggest readers refer to our Appendix for more methodological detail and transparency.

3. Results 1

RQ1 asked what percentage of public relations scholarship falls within the crisis communication paradigm. In our analysis (Table 1 of the Appendix), 9.78% of all of the language taken from the journals fell within groupings we identified as crisis communication.

RQ2 asked how IRT and SCCT interact with other clusters of public relations scholarship. We used the affinity score to assess how these two crisis communication theoretical frameworks show their affinities toward other clusters. Our findings, with details shown in Tables 4 and 5 in the Appendix, reveal that SCCT interacts most with the media relations (2.65) and management (2.13) clusters, interacts less with the internal (1.35), digital (1.14), and global (0.85) clusters, and interacts much less with the rhetorical (0.55), professionalism (0.36), and critical (0.26) clusters. In contrast, IRT interacts most with the rhetorical (2.20) and media relations (2.16) clusters, interacts less with the management (1.60), global (1.42), and digital (1.06) clusters, and interacts much less with the professional (0.96), critical (0.73), and internal (0.59) clusters.

H1a-H1c hypothesized the trends from Avery et al. (2010) of the relative quantities of IRT and SCCT research would stay the same. To provide an easy comparison, IRT and SCCT language amounts were summed to provide a combined total. During the time period, SCCT grew substantially. It started as significantly smaller than IRT, 39.5% of the combined scholarship in 2010, but grew to 81.1% of the combined scholarship in 2020 (see Table 1). Therefore, H1a (proportions remaining similar) and H1c (IRT staying constant) were rejected, while H1b (SCCT growing) was supported.

H1d-H1e followed Avery et al. (2010) and hypothesized that (d) SCCT would remain largely quantitative and (e) IRT would remain mostly rhetorical. We compared the affinity of each theory to each method to assess the degree of use. This research found that SCCT research is heavily quantitative. SCCT's affinity with quantitative methods was more than 3x greater than qualitative methods, 10x greater than network analysis, and 15x greater than rhetorical scholarship. In contrast, IRT's affinity was heavily rhetorical. IRT's affinity for rhetorical scholarship was more than 6x greater than qualitative methods or quantitative methods and 9x greater than network analysis. Raw affinity values are shown in Table 2. Therefore, H1d and H1e were supported.

RQ3 asked about the volume of SCCT and IRT language compared with non-reputation repair crisis communication scholarship in terms of connections to other clusters of public relations scholarship. Unfortunately, we found this initial analysis (Study 1) was inadequate to answer the question. While we were able to distinguish between IRT and SCCT, several other major topics within crisis communication scholarship (e.g., discourse of renewal) did not have their own topic areas and other topic areas that did exist were ambiguous as to whether or not they were reputation repair centered (e.g., post-crisis management). Therefore, this question was unanswered in this study and a second study was formulated to analyze it in more depth.

Table 1

Study 1 - Volume of SCCT and IRT across PR Scholarship.

Year	IRT	IRT %	SCCT	SCCT %	Combined Total
2010	0.030	60.5%	0.020	39.5%	0.049
2011	0.045	70.7%	0.019	29.3%	0.063
2012	0.024	48.0%	0.026	52.0%	0.049
2013	0.012	57.4%	0.009	42.6%	0.020
2014	0.025	55.5%	0.020	44.5%	0.045
2015	0.012	37.6%	0.019	62.4%	0.031
2016	0.027	57.3%	0.020	42.7%	0.046
2017	0.019	45.7%	0.023	54.3%	0.043
2018	0.018	35.3%	0.032	64.7%	0.050
2019	0.009	28.1%	0.023	71.9%	0.032
2020	0.009	18.9%	0.039	81.1%	0.048
Average	0.021	47.8%	0.023	52.2%	0.043

Note: Combined Total is sum of IRT and SCCT. Percentages are IRT or SCCT divided by Combined total.

Table 2

Study 1 - SCCT and IRT Methodological Affinity.

	IRT	SCCT
Network Analysis	0.053	0.032
Qualitative	0.072	0.085
Quantitative	0.070	0.311
Rhetorical	0.473	0.018

4. Discussion 1

This study explored the crisis communication paradigm as it exists within public relations scholarship using STM and bipartite network analysis (Song et al., 2020; Zhou, 2021). Using an analysis of the discipline's two SSCI journals, the study was able to quantify the percentage of scholarship reflecting the crisis communication paradigm and how the paradigm interacts with the other clusters of public relations scholarship with the new measure of affinity.

The study also began to explore different topics within crisis communication scholarship. A prior bibliometric analysis (Avery et al., 2010) had previously established an understanding of two dominant theories, IRT and SCCT, and this research offered an opportunity to update and extend this understanding based upon research from the next decade. As an initial step, this analysis compared the relative volume of scholarship studying these two dominant theories of reputation repair. It found that IRT had a larger volume in 2010, but that as the 2010s progressed, SCCT saw a significantly higher volume of scholarship and eventually became dominant.

Using STM as the method for this study also enabled a deeper analysis that could articulate how the theories are positioned, both in terms of the methodologies used to study them and the concepts with which they are most frequently examined. This knowledge provides an empirical assessment of how the theories are being used in scholarship. For instance, this research found that SCCT is heavily quantitative in nature, while IRT scholarship more often uses rhetorical methods. This provides one explanation for the rise of SCCT. Other research has documented that public relations scholarship has incorporated more sophisticated quantitative research in recent years, both as a reflection of the value of increasingly valuable tools as well as of practical considerations of timely research productivity, which are salient for many scholars (Page & Capizzo, 2021). Such a change lends itself to theories like SCCT that make testable predictions that are easily assessed with quantitative methods.

This research was also able to quantify the different broader clusters of public relations scholarship that SCCT and IRT each connected with. Both SCCT and IRT interact frequently with the media relations cluster. This finding illuminates a fascinating paradox of these theories. While they nominally describe how an organization should respond to stakeholders directly affected by a crisis, they are generally assessed based upon how less-involved third parties learn about the organization's response through media. In other words, it is important to realize that these theories are generally not studied as methods of actually communicating with the small number of individuals directly affected by a crisis. Rather, they are generally studied as giving the perspective of the much larger number of third parties who witness crisis responses through mediated communication and will potentially change their view of the organization based upon portrayals in mediated communication.

Further, the relative affinities of these methods to other topics also speaks to the distinct nature of these theories. If one ranks the affinity of both theories with each other cluster, the topic order is similar, though not identical. However, if one looks at the actual affinity scores, it becomes clear that some differences exist. For instance, SCCT has a stronger affinity with management concepts, including management and internal communication, than IRT. In contrast, IRT has a stronger affinity with concepts more closely tied to rhetorical scholarship, most

notably the *critical* and *global* public relations scholarship clusters. The relative differences in affinity help to explain the difference in worldview that is articulated by these theories.

Within the crisis paradigm, the study then sought to compare reputation repair scholarship with non-reputation repair scholarship in light of Liu and Fraustino (2014). Unfortunately, the initial methodological approach prevented an accurate comparison and pointed toward the lack of operational clarity between these two categories (reasonably so given the need for both in applied crisis communication contexts). While the 1293 article sample provided a bird's eye view that allowed us to position the crisis communication paradigm within broader public relations scholarship, our broad strokes clouded the distinctions between crisis communication research topics we could have detected if we solely focused on crisis communication articles. This caused a few dilemmas in analysis. For instance, in terms of crisis-centered theories, only IRT and SCCT were large enough to get their own topics and several topic areas could be described as either reputation repair or not reputation repair (e. g., post-crisis management). This prevented further comparison between reputation repair and non-reputation repair topics. Further, the topics sometimes had language regarding specific crisis communication theories (e.g., discourse of renewal) that were not big enough in the big pool of public relations scholarship to merit their own topic. Thus, we were unable to provide ideal comparisons with these theories. We realized that a narrower sample would allow us to explore the nuances of the crisis communication paradigm in more depth. While our first study provided a bird's eye view, a second study could act more like a magnifying glass, allowing us to dive into the weeds of the crisis communication paradigm. Therefore, we conducted a second study with a narrower sample composed only of articles that had more crisis communication content than the average article in the dataset. This would allow us to answer RQ3 and go deeper to explore the nuances within the paradigm. Therefore:

RQ3. (a) What topics of crisis communication scholarship exist beyond reputation repair? (b) What are their relative volumes? (c) Has the relative volume of the topics of crisis scholarship changed between 2010 and 2020?

RQ4. (a) How does reputation repair scholarship compare with non-reputation repair crisis communication scholarship in terms of volume? (b) Have these patterns changed over time?

RQ5. How do the topics of crisis communication scholarship interact?

H2. Non-reputation repair's percentage of crisis communication scholarship will increase between 2010 and 2020.

5. Method 2

We began by identifying the articles that studied crisis communication, defining the population as any article that discussed crisis communication more than the average article in the prior study. Since crisis communication on average takes up 9.78% of the last decade's public relationship scholarship, we used this number as the benchmark to determine whether a paper should be considered "a crisis communication paper." In other words, a paper that devoted at least 9.78% of its writing to crisis-related topics was included in our Study 2 sample ($N = 285$, among the study 1 population, $N = 1293$). Some of the most prolific authors in this subset (and within the two journals studied) are Yan Jin ($N = 18$), Brooke Fisher Liu ($N = 17$), Elizabeth Avery ($N = 9$), Lucinda Austin, Sora Kim, and Toni G.L.A. van der Meer ($N = 7$). Readers are referred to Table 6 in the Appendix for the list of all 285 articles. We conducted the same STM analysis procedure as in Study 1 on this subset, and selected 12 as the number of topics, based on model diagnosis (Appendix Figure 4) and qualitative reading (see Song et al., 2020; Zhou et al., 2023). The research team each individually came up with labels for these topics and then collaboratively discussed them to come to an agreement. In eight of the 11 substantial topics (with one

filler topic), the three researchers independently came up with nearly identical labels. In the remaining three groups, the researchers largely agreed conceptually but collaboratively labeled these topics. Topics were classified into those that are explicitly about reputation repair and those that are not explicitly about reputation repair.

6. Study 2 results

RQ3 asked about (a) the topics of crisis communication scholarship, (b) their relative volumes of scholarship, and (c) how those volumes changed over time. Modeling these 285 crisis communication articles, we find that the topics investigated and their proportions in the literature are SCCT (13.0%, including terms such as SCCT, attribution, accidental, and preventable), IRT (12.6%, including terms such as image, repair, apology, and offensiveness), social media (11.5%, including terms such as tweet, social, blogs, and Facebook), media relations (8.6%, including terms such as frame, news, and release), risk (7.6%, including terms such as health, risk, and tornado), CSR/reputation (7.1%, including terms such as reputation, brand, and CSR), discourse of renewal (6.4%, including terms such as renewal, relationship, and discourse), internal (5.9%, including terms such as resilience, employee, and distrust), paracrisis (5.5%, including terms such as rumor, complaint, and paracrisis), and emotion (4.9%, including terms such as emotional, sadness, and ICM[4]).

Notably, some of these topics were identified as clusters of broader public relations scholarship in study 1 (e.g., internal); however, their presence was so extensive that they also qualified as topics within crisis communication scholarship. We also identified a topic focusing on China (7.2%, including terms such as Chinese, mainland, and government) as many crisis communication studies use cases, data, or participants from the country.

We examined the relative volume of each topic by year to detect trends (see Table 8 in Appendix). Most notably, IRT declined dramatically from being the largest topic area in 2010 and 2011 (14.8% & 26.0% respectively) to being the smallest in 2020 (2.4%). Media relations also experienced a similar decline from 12.3% in 2010 to 2.4% in 2020. In contrast, internal (3.9–13.8%) grew considerably during the time period. Other topics were more variable depending upon the year without demonstrating a clear trend.

RQ4 and H2 asked for a comparison between reputation repair and non-reputation repair. We examined the topics and identified SCCT, IRT, CSR/reputation, and paracrisis as reputation related topics and the other topics (social media, media relations, risk, discourse of renewal, internal, China, and emotion) as not inherently being focused on reputation repair. Over the course of the examined time period, reputation language represented 38.2%, while non-reputation language represented 52.2%. We found that reputation repair generally declined as the decade progressed (every year from 2015 to 2019 was well below its decade average), while non-reputation repair generally grew; however, there are year to year variations in the data (see Table 3).

RQ5 asked how the topics within crisis communication scholarship interact. We conducted a network analysis in order to assess co-appearance of the topic areas within published articles (see Table 9 in Appendix & Fig. 1). Results indicate that social media, SCCT, and, to a lesser degree, media relations, each had strong connections with the vast majority of topic areas. The other topic areas had strong connections with a few areas. This finding indicates that social media, SCCT, and media relations are central topics within the paradigm.

7. General discussion

This research set out to explore the paradigm of crisis

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[4] This is the acronym for integrated crisis mapping, a theory of emotion in crisis (Jin et al., 2012).

Table 3
Study 2 - Reputation Repair vs. Non-Reputation Repair.

Year	Non- Reputation	Reputation Repair
2010	56.0%	38.8%
2011	46.0%	44.8%
2012	43.8%	42.8%
2013	55.1%	34.6%
2014	39.0%	48.7%
2015	59.6%	34.9%
2016	50.3%	36.5%
2017	51.2%	33.5%
2018	54.3%	33.0%
2019	61.2%	33.2%
2020	57.9%	39.2%
Average	52.2%	38.2%

communication within public relations scholarship (e.g., Avery et al., 2010; Toth, 2010) using a robust method that allowed for two-stage analysis of the full text of every relevant article in the discipline's two SSCI journals (Song et al., 2020). Our first study examined the position of crisis communication within the broader constellation of public relations scholarship clusters identified by Zhou et al. (2023). This approach allowed us to identify the volume of crisis communication scholarship, explore the position of crisis communication broadly and its dominant theories of SCCT and IRT specifically in the larger body of public relations scholarship, and clarify the methodological tendencies of scholarship using these theories.

Particularly, this research confirms the continuation of several trends identified in a 2010 bibliometric analysis by Avery and colleagues (e.g., SCCT's increase in volume, methodological differences between SCCT

and IRT), while identifying new patterns that have emerged since 2010. Notably, SCCT has grown within reputation repair scholarship relative to IRT. The broad lens of this first study prevented us from examining the paradigm with the level of detail desired, leading to a second, follow-up study in hopes of exploring the difference between reputation repair research and non-reputation repair research.

Our second study allowed us to dive deeper into crisis communication scholarship, finding 11 specific topic areas of scholarship within the paradigm. This analysis allowed us to track the volume of these topic areas over time to clarify trends in scholarship. Further, it allowed us to explore the intersection of these several topic areas, presenting an intellectual structure of the paradigm of crisis communication that, at present, has SCCT, social media, and media relations as central connecting topic areas. The centrality of these concepts is insightful in part because they are central for different reasons. Social media and media relations are not theoretical lenses in and of themselves. Rather, they are topics describing the channels through which much of crisis communication is conducted. Their centrality reiterates that a significant portion of crisis communication is mediated either through traditional news sources or social media. In contrast, SCCT is a theoretical lens. The theory's centrality confirms its growth found in Study 1 and suggests the theory's growth has infused much of crisis communication scholarship. Put simply, SCCT is connected with a broad range of ideas in crisis communication, even topics such as emotion and risk that are not necessarily reputational in nature.

Further, internal communication became a larger part of crisis communication research. This finding highlights an important trend, as internal communication had been previously identified by Zhou et al. (2023) as its own cluster of public relations scholarship. Interestingly, a
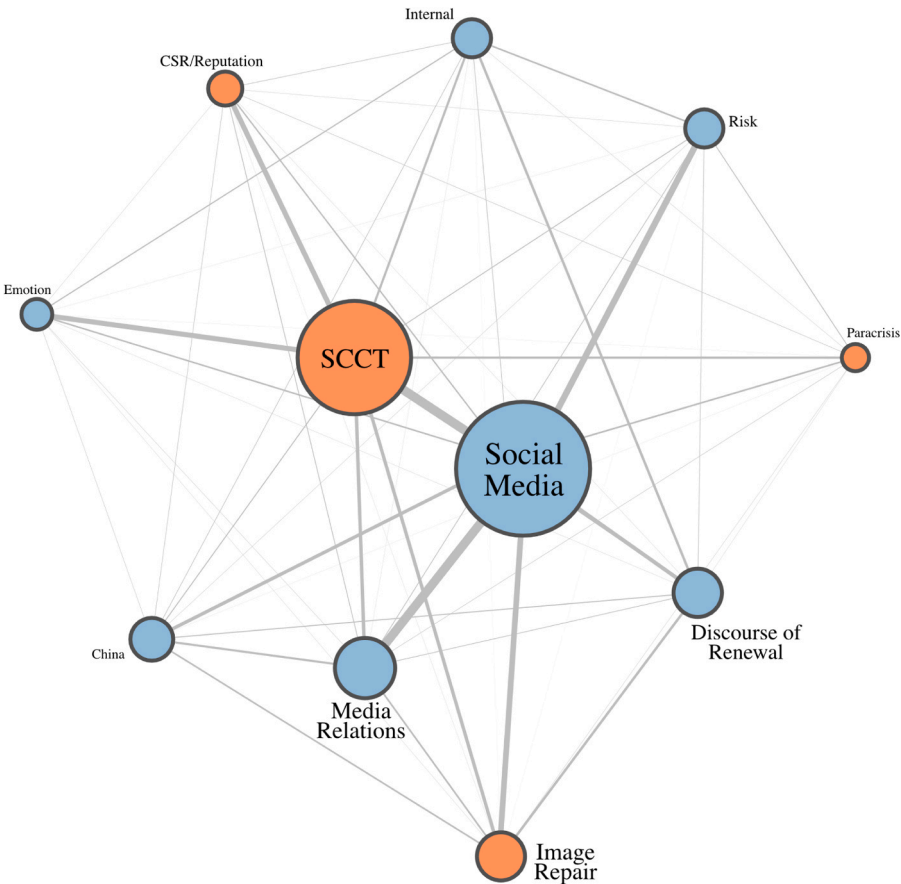

Fig. 1. The Network of Topic Co-Appearance in Crisis Communication Scholarship. *Note:* In the visualization, edge weight corresponds to the research topics' strength of co-appearance in selected crisis communication publications ($N = 285$). Node size and label size correspond to the research topic's weighted degree in the network. The color orange indicates reputation repair scholarship, while the color blue indicates non-reputational repair scholarship.

few of the broader clusters of public relations are so relevant within crisis communication scholarship that they showed up as their own topics within the paradigm. This finding serves to reinforce the interconnected, polyparadigmatic nature of public relations research.

Media relations declined considerably over the duration of the study. While study 1 noted that both SCCT and IRT have a strong affinity for media relations, the media relations topic itself shrunk over time. This reflects a changing media landscape in which communication generally and crisis communication specifically are moving away from traditional channels and toward social media. This change presents an important opportunity for crisis communication scholarship to recognize and incorporate the unique attributes of social media into our theorizing. The unique features of social media therefore require additional incorporation into crisis communication theory as suggested by Liu and Fraustino (2014). The paths suggested by these scholars held up very well in this research.

Liu and Fraustino (2014) called for the growth of non-reputation repair scholarship and suggested four potential paths for crisis scholarship: reputation repair, complexity-understanding, resilience-generating, and social media. In study 2, non-reputation repair scholarship appeared to grow significantly in the following year (2015) relative to reputation repair scholarship and continued through the rest of the decade. Further, social media became a prominent bridging topic area, while SCCT continued to lead reputation repair scholarship. Discourse of renewal and internal communication (with a key term of resilience) also appeared in study 2, representing the resilience-generating path of scholarship. Of the paths forward presented by Liu and Fraustino (2014), only the uncertainty-understanding path is largely missing from these results. The growth of research into resilience and social media provides a starting point, but more research in community-oriented approaches to crisis has the potential to ensure best practices support societally beneficial outcomes and broaden the positive impact of public relations scholarship.

7.1. Limitations and future research directions

This research is bounded by the journals we selected. We chose to focus on the paradigm of crisis communication within public relations scholarship, leaving out other crisis and risk focused journals (e.g., *Journal of Contingencies and Crisis Management*). Future research could provide additional insights based on an expanded dataset. Further, we focused on the two SSCI-indexed public relations journals to be consistent with Zhou et al. (2023); however, this left out several public relations journals used in other review work (e.g., Ki et al., 2019). As a result, one limitation is that our journal selection bounds our results, which are not inherently representative of all crisis communication scholarship or all public relations scholarship. Further, while we detected trends over the specified time period 2010–2020, we cannot presume to know what will happen outside of this time period. This study found different trends from prior analyses and we suspect analyses of future time periods will find new trends from what is discussed here. We thus encourage scholars to replicate our study in 2030, 2040, or 2050, and those who are interested in the history of crisis communication scholarship to collect full-text data prior to 2010.

There is also a limitation imposed by our interpretations and choices. We used computational metrics to inform our choices on the number of topics in each study, and the raw number of topics were chosen by the research team. Further, we labeled the topics and clustered groups of topics based upon our qualitative interpretation and meaning making. While our selections demonstrated strong face validity, a different group of public relations researchers might come up with different answers, thus affecting the interpretation of the crisis communication paradigm, its scope, and its development throughout the past decade. Because of this limitation, we have provided an extensive appendix for the qualitative part of the study, which includes the raw data output from our models, so the reader can assess the quality of our interpretations and

findings themselves. We have also adhered to principles of open science and provided analysis scripts for replication purposes. Inquiring entities can contact the authors to access the complete dataset of the 1293 papers we collected. We believe our results are valid and meaningful for public relations and crisis communication scholars, but we acknowledge that any method managing this much data is imperfect.

7.2. Conclusion

This research has identified key trends in crisis communication scholarship including the growth of SCCT, the decline of IRT, and a growing focus on social media and internal communication. The crisis communication paradigm evolved over the last decade with SCCT, social media, and media relations as central connecting topics that bring together several disparate areas addressing crisis from many perspectives. Discourse of renewal, emotion, and paracrisis were identified as key to the paradigm. Taken together, these findings suggest the paradigm is no longer focused solely on reputation repair and today reflects the call of Liu and Fraustino (2014) to focus on new paths. Crisis communication is a robust, growing paradigm with rich theoretical and methodological diversity. It provides an excellent example of the generative value of interconnected scholarship—the strength and vitality gained from a research area that uses a variety of tools and perspectives to approach a shared set of questions and problems.

Declaration of Competing Interest

The authors have no conflict of interest to report regarding this research.

Data availability

Acknowledgements

Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.pubrev.2023.102349.

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