



Making a Difference in ICT Research: Feminist Theorization of Sociomateriality and the Diffraction Methodology

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Abstract. Over the last decade, sociomateriality appeared as a theme in IS research that has been interrogated with a variety of theoretical lenses. However, researchers have since raised methodological concerns regarding its application. This paper argues that a research methodology cannot be separated from either the theoretical lens that the research adopts or from its overarching purpose. Considering the broad range of theoretical lenses through which sociomateriality could be examined, this paper focuses on Barad's theory of agential realism [25]. The paper provides a brief history of agential realism to shed light on the reasons behind IS researchers methodological difficulty and offers a diffraction methodology as a possible methodological guide to IS research adopting this lens. Implication for research is discussed.

Keywords: Sociomateriality · Agential realism · IS research methodology
Diffraction methodology

1 Introduction

The term sociomateriality has been in circulation in the IS field for a decade. It was initially introduced as an umbrella term [1] that advocates and emphasizes the role of the material aspects in everyday organizing and social life [2]. It has been studied through different theoretical lenses including the sociotechnical approach [3–7], pragmatism [8], Gibson's concept of affordances [9], the practice lens [10], Actor Network Theory [11–14], and agential realism [15–17]. It has also received healthy (and sometimes heated) debates regarding its philosophical premises and alternative theoretical lenses to examine it. However, IS scholars largely agree that it broadens the definition of the technical and draws attention to the material aspects of social activities [18, p. 34 and 42, 19, p. 810].

Information systems' (IS) researchers have reported difficulty in designing research, collecting data, analyzing data and reporting on the non-human when adopting the Sociomateriality theme and in particular its agential realism theoretical lens [19, p. 813, 20]. They question "...where does one start, methodologically and analytically" [21, p. 219] and find it generally challenging to collect data [17, 22], analyze data [23, 24] and report on findings [10]. Indeed, the different lenses used to examine sociomateriality could have "very practical consequences" on the research process from the focus of the

research and research questions up to the research contribution [18, p. 60]. Hence understanding the root of the methodological problems IS researchers face when applying agential realism requires an examination of the roots and orientation of this lens.

This paper aims to provide theoretical and methodological clarity within the sociomateriality research that adopts the lens of agential realism [25]. Agential realism is a useful lens for IS research that could provide fresh perspective on complex digital phenomenon that are significantly distributed and appear unbounded but produce observable effect [26]. It provides a theoretical grounding for the IS research to cross its traditional organisational boundaries to account for contemporary digital phenomenon such as having rating systems or health network systems based on thousands and millions of globally distributed members producing effect of evaluating or providing medical research. Hence, it could help us unpack and understand the complex relations of people, databases, algorithms, organisational strategy and profit opportunities that produce significant outcomes for society.

The paper traces the origin of agential realism in order to understand its methodological implications and the roots to the methodological problems IS researchers face. It introduces diffraction as a possible methodology for research adopting this lens and discusses how it could be adopted throughout the research process including literature review, data collection and data analysis. In doing so, the paper contributes to facilitating the adoption of the lens of agential realism in IS research, advancing its methodology and expanding the sociomateriality thinking.

The paper is divided into six sections. The following section presents a brief history of agential realism and its roots. Section Three discusses its adoption in IS and analyses the sources of methodological difficulty faced by researchers in its application. Following this, Section Four presents the concept of diffraction while Section Five discusses its application throughout the research processes including literature reviews, data collection, data analyses and in the formulation of research findings and purposes. The final section then provides a discussion and conclusion to the paper.

2 Agential Realism and Contemporary Feminist Theorization

Agential realism is undeniably part of a long history and trajectory of contemporary feminist theorization and “owes much to a thick legacy of feminist theorizing” [27, p. 168]. It aims to move beyond the traditional dichotomy of realism and social construction to provide “a more robust understanding of materiality ...that enables feminists and other liberatory theorists to take account of the ways in which “matter comes to matter”” [28, p. 98].

Feminist theorisation has passed through stages of development from having a fanatic focus on women to attempting to find explanation to the different sexual orientations and hence developing the concept of gender. Contemporary feminist theorists argue that the development of the concept of gender, while ground-breaking in feminist theorisation, is still founded on a binary distinction between biological sex and sexual orientation (sexuality) or between nature and culture [29, 30]. Contemporary feminist theorists sought ways to avoid feminist research confinement in yet another power-producing binary. They propose an understanding of gender/sex as an entangled

cultural-natural phenomenon and argue that material reality and the body are discursively constituted [31, 32]. Contemporary feminist theorist Judith Butler's work on "recasting the matter of bodies" and the re-thinking of materiality and power has been influential in this regard [33, p. xii]. Butler's revolutionary conceptualization of the notion of 'matter' has served as a milestone in contemporary feminist theorization and provided inspiration for many contemporary feminist theorists. She proposes a process view of matter "... not as a site or surface, but as a process of materialization that stabilizes over time to produce the effect of boundary, fixity, and surface we call matter." [33, p. xviii] [emphasis as in original].

Another milestone in contemporary feminist theorization has been established by Haraway's development of the notion of the hybrid or cyborg [34] and her positioning of 'material-semiotics' as an epistemological presupposition [35]. For Haraway, the hybrid or cyborg is an effect of complex interaction among the person, material and entity. Through this work, Haraway has encouraged researchers to explore the co-constitution of sociocultural and bodily material aspects in ways that avoid both traps of biological and material determinism or cultural essentialism [31, 36]. Researchers have since adopted this view to examine not only the production of the body, gender, and sexuality but have also extended it to study other intersecting power differentials such as race, ethnicity, class, disability and human rights [31, 32].

Likewise, Barad also demands a contemporary feminist theorization in which "[n] either discursive practices nor material phenomena are ontologically or epistemologically prior. Neither can be explained in terms of the other. Neither is reducible to the other. Neither has privileged status in determining the other. Neither is articulated or articulable in the absence of the other; matter and meaning are mutually articulated" [25, p. 152]. However, she finds "Butler's conception of materiality is limited by its exclusive focus on human bodies and social factors, which works against her efforts to understand the relationship between materiality and discursivity in their indissociability" [25, p. 34]. Hence, Barad offers a more radical theoretical reworking of binary that conceptualizes matter as "a sedimented intra-acting, an open field" that does not entail closure and rather finds the formation of mountain ranges in their multiplicity and liveliness to be attesting to "this fact" [27, p. 168]. Influenced by the context of her research on Physics, she crafted the concept of intra-activity; an originally physicist terminology. However, Barad develops the concept of intra-action to reflect the relationships between any organism and matter, human or non-human, emphasizing that "all matter can be understood as having agency in a relationship in which they mutually will change and alter in their on-going intra-actions" [37, p. 4]. In this sense, all matter are "understood not to have definite and inherent boundaries, but are always in a state of intra-activity of higher or lesser intensity or speed" [38, p. 530]

Barad proposes the notion of discursive practices as an ongoing material reconfiguration of the world [39]. In doing so, she advances contemporary feminist theorization through fundamentally rethinking ontology and epistemology as intermingled in what she terms 'onto-epistemology' and provides deconstruction based on this view¹

¹ For more details on how Barad's research builds on the thick legacy of feminist theorization, see [27].

in the context of physics and the production of scientific practices [28, 40, 41]. Aiming to disrupt binary divisions and find a way to conceptualize differences in a new way, she developed an agential realist view of the world. Her agential realism theorization extends both Butler's work on materialization and the relationship between the material and the discursive [28, p. 89] and Haraway's development of the epistemological metaphor of 'diffraction' [35, 42]. In doing so, Barad's work aims to sharpen the theoretical tool of feminism and bring new insight to examine differences and their production [27, 39].

While contemporary feminist theorisation has departed from feminist theorisation in recognising and attempting ways to resolve binary thinking, it shares with its predecessor a concern for critique and transformation. However, contemporary feminist theorisation has widened this mission to include critique of all types of differences. Hence, it is considered a powerful theoretical lens to deconstruct preconceived notions and binary divisions such as those between object/subject and human/non-human [43–45]. It is not limited to feminism or the studying of women, gender or sexuality as it went well beyond this to explore differences and how they come into being [46, p. 18]. It has been adopted in a wide range of disciplines including economics [47, 48], politics [49], art [50], geography [51, 52] and health [53, 54] to fundamentally examine phenomenon as diverse, for instance, as globalization, mental health, human rights, poverty, disability and medical care.

3 Contemporary Feminist Theorization in IS and Its Methodological Difficulties

Contemporary feminist theorization including agential realism has been embraced in the IS field mainly through its adoption by the Sociology of Science and Technology Studies' (STS). STS's adoption of contemporary feminist theorizing, including Mol and Suchman's work, has been frequently cited in IS as the roots for 'sociomateriality'. This is despite, Mol's [54] recognition of her effort to develop a contemporary feminist theorization of science, technology and medicine. Through adopting contemporary feminist theorisation, Mol navigates the way between subject/object ontologies by stressing the multiplicity of ontologies for the human body. She argues for the performativity of ontologies and that "... *ontologies* are brought into being, sustained, or allowed to wither away in common, day-to-day, sociomaterial practices" [54, p. 6]. Her work consistently adopts contemporary feminist thinking to show the multiplicity of reality and the enactment of multiple ontologies and multiple logics of care, disease, diagnosis and medical discovery [54–57].

Lucy Suchman has also benefited from contemporary feminist theorization in her examination of technology design and use [58–60]. She argues that contemporary feminist theorization could "add[s] crucial sensibilities to the reconception of agency" [58, p. 6]. In particular, Suchman finds the work of Barad's agential realism to be providing 'materialist constructivism' that is radical in understanding that material phenomenon is inseparable from the apparatuses of bodily production and that it emerges out of the ongoing reconfiguration of subject/object boundaries [58].

The IS field's adoption of agential realism has focused mainly on its material and practice side and the view that it "puts capacity for action and entanglement in practice on our agenda" [17, p. 213]. As a result, the IS field has largely focused on materiality, inseparability, relationality and performativity [19, 61] and which and how many of these aspects must be featured in a study [61]. This understanding has contributed to the methodological difficulties that IS researchers face when applying this lens. Besides depicting agential realism's research as having fixed necessary components, it overlooks the fundamental views of intra-activity, ontological primacy to phenomenon and difference-making that this theoretical lens holds. Indeed, contemporary feminist theorization advocates a new mode of science that attends to complexity, indeterminate encounters, fluid ontology and intra-action. It accepts and account for multiplicity and stands firmly against having a universal truth. In this regard and considering its strong theoretical standpoint, it is not possible to adopt agential realism and associated contemporary feminist theorization while continuing the quest for objectivity with approaches rooted in chronology, order and fixed agencies. This gulf between the theoretical lens and its premises on one hand and the research methodology on the other hand creates methodological tension. It uncouples the link between the epistemology (knowledge of the phenomenon) and research methodology (scientific knowledge production). Hence allows researchers to pursue two different – and rather contradictory - logics in one piece of research. Since agential realism holds radical views on ontology and epistemology, its theoretical lens on phenomenon cannot be separated from the scientific knowledge production throughout the research process.

Contemporary feminist theorization contests the knowledge production mode of traditional science. The agential realism notion of intra-action applies to the research process as much as it applies to the phenomenon under examination. Indeed, it provide an alternative view beyond realism and relativism that have dominated the traditional production of scientific knowledge [62]. In doing so, Barad joins Haraway in moving beyond the notion of reflexivity advocated by relativism arguing that it has strong mirroring orientation where something is reflected from a stable entity [25, 28, 35, 42]. Contemporary feminist theorists argue that reflexivity consistently treats one side as fixed in order to measure against and reflect on and, in the process produces and emphasises sameness. The researchers' reflection on phenomenon assumes that researchers are outside the phenomenon, separated from it and looking at it [35]. In contrast, contemporary feminist theorization argues that researchers are irrevocably part of the phenomenon and its production. Based on quantum physics, Barad [25, 28, 62] argues that knowledge production is not only about epistemology but also about ontology [63]. Hence, the researcher, researched and research apparatuses "cut-together apart", defining each other and making an impact in the world [27].

Agential realism's consideration of knowledge production as an onto-epistemological phenomenon challenges longstanding traditions in studying the production of knowledge, including research knowledge. Indeed, it challenges the current epistemological focus of knowledge production in research and instead invites new types of methodologies that account for differences in an onto-epistemological view. In this sense, Stumpf [64] argues that "behaviours, just as thoughts, ... exist only in relationship to other behaviours, the process of observing them or sharing ideas

introduces a new relationship – hence the observed behaviour or shared idea is different from its unobserved counterpart” [64, p. 41].

In information systems, the traditional science is considered ingrained in the scientific community [65]. This is challenging for IS researchers who adopt contemporary feminist theorization including agential realism. They need to navigate a way to present research based on new science to a research community guided by traditional science rules. Believed to be inescapable, Baskerville and Pries-Heje introduced the notion of “wrapper” to bridge between the knowledge production of new science and the demands of old science for representation [65]. However, wrapping the propositions and theoretical stance of new science in an old science disguise could miss out the richness and value of the new science and produce research that is of less value. In contrast to this view, contemporary feminist theorists and researchers have taken the concept of intra-action seriously and experimented with the diffraction methodology as a way to effect change in research processes and outcomes. Diffraction was introduced as an innovative research methodology that allows for intra-action during the research process, thus giving way to new ideas, possibilities and transformations [25]. It works against the wisdom of traditional science in terms of having defined entities to be observed. Adopting diffraction means that the researcher is focusing on the intra-action through which entities are defined and are being defined. This does not reject the notion of entities and having distinctions between them but it rejects fixed pre-assumed agencies and relationships outside of the intra-action [63, pp. 253–254]. The following section elaborates on the diffraction methodology as presented by contemporary feminist theorists.

4 Taking Research Intra-action Seriously: The Diffraction Methodology

Haraway has highlighted the problematic nature of reflection as a pervasive trope of knowing, the parallel notion of reflexivity as a method or theory of self-accounting, and hence the problems of taking account of the effect of the theory or the researcher on the investigation [25 p. 72]. She found the epistemological practices of reflexivity anchored in representation to be dissatisfying and consequently critically assessed its theoretical assumptions and consequences. She coined the metaphor and concept of diffraction by proposing the notion as an alternative to reflexivity. Diffraction refers to various phenomena that occur when waves meet a barrier such as an obstacle or a slit. These waves bend and spread out in the area beyond the barrier or slit producing a new pattern. There are many different ways for diffraction to occur depending on the phenomenon such as light or water, the nature of the barrier including slits or rocks and the size of the barrier. Haraway argues that:

“[r]eflexivity is a bad trope for escaping the false choice between realism and relativism in thinking about strong objectivity and situated knowledges in technoscientific knowledge. What we need is to make a difference in material-semiotic apparatuses, to diffract the rays of technoscience so that we get more promising interference patterns on the recording films of our lives and bodies” [35, p. 16].

Haraway's point is that the methodology of reflexivity mirrors the geometrical optics of reflection, and that all the focus on reflexivity as a critical method of self-positioning remains caught up in geometries of sameness. In contrast, diffraction conveys our knowledge-production practices and the differences that they make on the world. Hence, it recognises that knowledge production is not a linear process that travels in direct line. It is rather an infusion of ideas, phenomenon, technology and researchers that intra-act to produce the research.

Diffraction also recognises multiplicity and that different effect of a phenomenon could occur depending on the intra-acting matters. Hence, diffraction shifts the research's focus towards how differentiation is made and where the effect of difference appear [42]. In the context of gender, Haraway clarifies that "[g]ender is always a relationship, not a performed category of beings or a possession that one can have. Gender does not pertain more to women than to men. Gender is the relations between variously constituted categories of men and women (and variously arrayed tropes), differentiated by nation, generation, class, lineage, color, and much else" [35, p. 28]. In the same vein, we can think of our IS phenomenon. Systems users for example is also a relationship not a fixed category of users and non-users. This opens the space for us to understand multiplicity and differences of use and how they come about.

Haraway's notion of diffraction was subsequently adopted and further developed by Barad [25, 27, 63, 66]. Barad agrees with Haraway that diffraction could serve as a counterpoint to reflection and reflexivity. While both are optical phenomenon and metaphors, reflection indicates mirroring and sameness whereas diffraction indicates patterns of difference. Barad goes a step further to elaborate on the notion of diffraction as "a tool of analysis for attending and responding to the effects of differences" [25, p. 72]. In this sense, it is the duty of the researcher to report on how the effects of these differences occur and matter. For Barad, diffraction is also "a method and practice that pays attention to material engagement with data and the "relations of difference and how they matter" [25, p. 71, 67]. Barad conceptualizes diffraction not as opposed to sameness, but as a dynamism where intra-actions between entities enact agential cuts that do not produce absolute separations but rather cut "together-apart" [27, p. 168].

To sum, diffraction is both a subject of research and a research practice. As a subject for research, Haraway asserts that "[d]iffraction is a narrative, graphic, psychological, spiritual, and political technology for making consequential meanings" [35, p. 273]. As a research practice, the diffraction methodology is concerned with exposing, making and practising diffraction as part of adopting contemporary feminist theorization [68] as the following section explains.

5 Diffraction: Changing Waves and Making a Difference in IS Research

Diffraction is concerned with differentiation and the creation of the new from the existing. As a research methodology, it has been adopted in different disciplines including education [67, 69], contemporary feminist studies [27, 70], arts [71, 72], philosophy [73], psychology [72, 74], and humanities [75, 76]. This section presents the application of the diffraction methodology throughout the re process.

5.1 Diffractive Reading of Literature (Diffractive Literature Review)

A diffractive literature review seeks to bring literature from different traditions together and read the texts through a lens to establish how their differences and similarities could give rise to something new. It does not aim to identify gaps in the literature and position the research as filling this gap but rather aims to create another layer for reading. This layer of reading does not simply aim to close areas where a plethora of research exists and instead uncover areas where research is needed or categorize and establish binaries between school of thoughts [77]. Rather, it is a positive approach to reading previous research from a particular position or theoretical lens to see what new understanding could emerge and what new questions and issues we face. Thus, a diffractive reading of literature “allows their insights to strengthen, challenge and articulate one another” [78, p. 190].

Diffractive literature review provides positive reading and critiquing of literature. It “... breaks through the academic habit of criticism and works along affirmative lines” [73, p. 22]. Affirmative reading involves “a mode of assenting to rather than dissenting from those ‘primary’ texts” while engaging with critique and involving the reader in the transformation of the literature towards a new avenue [79, p. 3]. While criticism of previous work is seen as a form of dismissal and boundary creation, reading diffractively involves working towards “more promising interference patterns” [35, p. 16]. It entails reading important insights from different strands, schools of thought or disciplines and reworking concepts. In doing so, it allows us to affirm and strengthen links between strands of literature and school of thoughts.

Diffractive reading is emergent and unfolding. Barad further elaborates on the diffractive literature review saying:

“diffraction does not fix what is the object and what is the subject in advance, and so, unlike methods of reading one text or set of ideas against another where one set serves as a fixed frame of reference, diffraction involves reading insights through one another in ways that help illuminate differences as they emerge: how different differences get made, what gets excluded, and how these exclusions matter.” [25, p. 30].

5.2 Diffractive Data Collection: Reading Data Through One Another

Barad [25, 39] argues that the technologies of observation not only cannot be separated from what is observed, but that they will always be intra-acting with (affecting and interfering with) the phenomenon under study. In this regard, it consider data collection as an onto-epistemological space of encounter [80]. Viewing data collection as an encounter focuses attention on the ongoing intra-active processes through which phenomenon and involved players are being produced. In this regard, researchers are invited not to have preconceptions and a priori assumptions that fix entities. Instead, they are encouraged to have an open encounter that allow for entities to be “more mobile, intra-active and multiple than our modes of enunciation normally suggest” [74, p. 3]. The task of the research when adopting diffractive data collection “is not to tell of something that exists independent of the research encounter, but to open up an immanent truth – to access that which is becoming true, ontologically *and* epistemologically, in the moment of the research encounter” [74]. A research encounter in this

sense is experimental – the researcher does not know in advance what onto-epistemological knowledge will emerge from it [32, 38].

As researchers, we are largely influenced by Western philosophy that has long-privileged a view that begins with distinctions and clear boundaries. In contrast, agential realism unsettles boundaries and position the very making of boundaries as the subject of investigations. Hence, a question on impact of technology on people and organization cannot be answered using agential realism. Indeed, agential realism is “unsuitable to studying the “impacts” of technology or how technology “inscribes” aspects of social structure” [26, p. 77]. This is because a question on ‘impact’ assumes the existence of boundaries, distinct entities, and determinate relationship. The question in agential realism will be about how agential cuts occur and differences are being made. Diffractive data collection does not place the object or the subject in the center of data collection, attempt to predefine entities and their relationship, or gloss over one for the benefit of other. Instead, the researcher focuses on the phenomenon and the intra-acting elements that produce it. The researcher is no longer an outsider tasked with observing and collecting data about an external phenomenon but rather part of the phenomenon that they produce.

In terms of data collection methods, agential realism is open to all data collection method. It should be noted here that Barad resides to historical analysis of experiments in physics, other researchers adopt interviews, participant observation, or participative co-production methods as ways for collecting data.

5.3 Diffractive Analysis: Finding How Differences Are Being Made

In line with contemporary feminist theorization, diffraction supports critical inquiries and analysis as it foregrounds differentiability [76]. A diffraction pattern does not map where differences appear, but rather maps where the effects of difference appear [42, p. 300]. As a result, diffractive analysis focuses on the phenomenon and the effects of intra-action on the phenomenon. The central project for contemporary feminist theorization has been “to avoid the interpretive question ‘what does it mean?’ when reading theory or analysing data, and instead ask: ‘how does it work?’ and ‘what does this text or data produce?’” [32, p. 268].

Diffractive reading of data is unlike interpretation. In interpretation, there is the interpreter (researcher), the interpreted and the interpretation that mediates between them. This thinking is binary where the researcher is seen as external to the phenomenon; “unaffected by and external to the interpretive process” reflecting the illusion of a detached researcher who at best reflects on his/her practices [81]. Analysis following the diffraction methodology is more concerned with making waves and “experimenting with different patterns of relationality ... to see how the patterns shift” [82]. As diffraction goes beyond reflection and production of sameness and mirroring, diffractive data analysis goes beyond coding as coding tend to produce what is known and repetitive [83]. In diffraction, the researchers create waves of intra-actions between different data sets and between data and theories where their analysis moves from one state to another. Diffraction, as an analytical way for thinking, “does not try to fix those processes so that they can be turned into a methodic set of steps to be followed. Rather, it opens the possibility of seeing how something different comes to matter, not only in

the world that we observe, but also in our research practice” [80, p. 3]. In this case, the research questions emerge with its data and analysis and advances with the researchers’ own changes and transformation. In documenting her experience, Palmer reports that “the data did not only transform the kind of knowledge that was produced by the analytical work; it also transformed me as researcher” [69]. In Palmer’s case, the researcher’s intra-action and evolvment is part of the story. Barad explains the entanglement of the research, saying: “So while it is true that diffraction apparatuses [of physics] measure the effects of difference, even more profoundly they highlight, exhibit, and make evident the entangled structure of the changing and contingent ontology of the world, including the ontology of knowing. In fact, diffraction not only brings the reality of entanglements to light, it is itself an entangled phenomenon” [25, p. 73].

Davies [74] elegantly comments on her analytical practices, saying that: “I cannot simply reflect on my analytic practice as if it were an observable entity. It is a series of movements, affected already by the choice to see them as diffractive, and to think about them diffractively. And if analysis is a set of encounters among meaning, matter and ethics, as Barad suggests, those encounters are always already affecting and being affected by the meanings and mattering that I am analysing. This should not be read as weakness of qualitative work, but rather, in Barad’s terms, a means of getting closer to the “fundamental constituents that make up the world” [25, p. 72]. Davies describes here research encounter saying: “The stories I tell and the analytic work I do with them are an entanglement of intra-acting encounters, and the very act of writing about them is one further element in a complex array of entangled movements” [74, p. 4]

Diffractive analysis opens up space for the encounter; firstly, in terms of those who we encounter as researchers and secondly, by being open to being changed by each encounter [84]. In sum, it focuses on difference: difference the research makes, difference the researchers’ make, differences that subject-object intra-action make. Binary differences are not a starting point for research. Rather, the difference of the phenomenon is what matters. The resulting explanation of how differences are created is core, not the description of how an object was constructed or how a subject interacts with it. Instead, diffractive analysis focuses on how they come together to make a difference in terms of subject, object and instrument.

As a methodology of contemporary feminist theorization, diffraction focuses its attention on the phenomenon and how it emerges through intra-action. Chia has previously drawn the attention of the Organization Studies’ community to the ontological character of reflexivity, suggesting the recognition of “the primacy of a becoming-realism in which the processual becoming of things is given a fundamental role in the explanatory schema” [85, p. 31]. He also draws attention to process-philosophy and the impact of its adoption in Organization Studies [86]. Ceecez-Kecmanovic argues that adopting a process-philosophy in IS goes beyond established traditions of interpretivism and hence presents a fundamental challenge to researchers in its adoption [87].

Indeed, like Chia’s and other process-philosophers’ approaches, diffractive analysis shares a concern with ‘How’ and the impact on the phenomenon under study. However, diffraction holds a distinctive view on reflexivity as it replaces the usual concept and practice in qualitative research and the inherent assumptions of representations and independence of the researcher’s gaze [32, 88–90]. Reflected in the research practices,

researchers need to consider the encounter along with the phenomenon, the material apparatuses of research, and the knowledge-producing practices as entangled aspects of research. They need to recognize that all the entities involved in their research are constituted in the action of knowledge production, not before the action starts [35].

5.4 Diffraction in Research Output: Making a Difference

Diffraction is concerned with making a difference, including making a difference through the research. Haraway and Barad developed diffraction to move our ideas of scientific knowledge from reflective, disinterested judgment to mattering and embedded involvement [76]. Research is then seen as an intervention in the world. Diffraction is part of contemporary feminist theorization which holds strong concerns on ethics, liberty, freedom, equality, human rights and environmental issues [31]. Diffraction calls for spelling out these concerns through research. Research adopting agential realism and other contemporary feminist theorization, including the associated methodology of diffraction, should then be a call to arms, a voice of freedom, liberation, equality, ethics that calls for change, transformation and arms to action. For example, research on ultrasound scanners and 3D medical imagery has produced detailed analysis on agency and relationships of the foetus, scan technology, medical practices, mothers, family and surrounding societal images. It draws attention to the critical question of human rights and has contributed significantly to the debate on women's and foetus rights. Most IS research adopting agential realism and other contemporary feminist theorization engages with different strength on how a phenomenon is produced whilst paying less attention to why the phenomenon matters [58]. The latter is in the heart of contemporary feminist theorization, including agential realism and should be part and parcel of adopting such a theoretical lens [91–93].

To sum, the value of contemporary feminist theorization and its associated diffraction methodology lies in its purpose and mission. This is of particular interest to IS research that “has focused almost the entirety of its resources on theoretical and technical knowledge, ignoring ethical and applicative knowledge” [94, p. 268]. It also brings about a much-needed perspective regarding ethics which is currently “under-represented in IS” [95].

6 Discussion and Concluding Remarks

Information systems' researchers adopting the sociomateriality theoretical lens of agential realism have reported difficulty in designing research, collecting data, and reporting on the non-human when adopting contemporary feminist theorizations. This paper argues that understanding and eventually resolving the methodological difficulty requires deep understanding of the theoretical foundation of agential realism and its mission. The paper unravels one of the core foundation of agential realism in contemporary feminist theorization and discusses its purpose and mission. It also shows that contemporary feminist theorization holds strong views opposing binaries and boundary creation and hence has a long tradition of deconstructing and understanding

how differences come about. Furthermore, the paper also demonstrates that contemporary feminist theorization share with its predecessor feminism an interest to critically engage with phenomenon calling for transformation and change.

In this light, the paper discusses few of the roots to our methodological difficulty when applying agential realism as research tends to overlook the fundamental views of intra-activity, ontological primacy to phenomenon and difference-making that this theoretical lens holds. Consequently, the paper positions agential realism and contemporary feminist theorisation in ‘new science’ that attends to complexity, indeterminate encounters, fluid ontology and intra-action and which accepts and account for multiplicity and stands firmly against having a universal truth. In terms of the methodological difficulty experienced by IS researchers, this paper suggests that this difficulty stems from three main points. Firstly, the adoption of agential realism and contemporary feminist theorization as part of Science and Technology Studies. It showed how this misconception prevented IS researchers from understanding the “thick legacy” of feminist theorization and its purpose [27]. Secondly, a further methodological challenge can be observed because contemporary feminist theorization, including agential realism, presents new science whereas IS researchers tend to be more immersed in old science techniques. This could explain the struggle of IS researchers trying to present new science in an old science format [65]. Finally, using data collection methods that center the subject creates a methodological problem in analytically decentering the subject following agential realism and other contemporary feminist theorization. This creates the reported research dilemma of how “to keep the material in the storyline without falling from one side to another”, resulting in “either leaving the material realm unexamined, or emphasizing the agency of the material at the determinant of understanding the entangled practice” [10, pp. 292–293].

The paper discusses the notion and methodology of diffraction that contemporary feminist theorists developed [25, 27, 28, 35, 42]. It discusses how diffraction could benefit the research process including conducting literature reviews, data collection and data analyses. In doing so, it responds to Walsham’s call for IS researchers to engage, influence and make a difference in the world that they study [96].

In conclusion, contemporary feminist theorization and the associated methodology of diffraction could be fruitful avenue for IS research to explore as it enters into examining unbounded and indeterminate phenomenon that go well beyond the traditional confinement. This paper provides a start for a diffractive discussion where the new could be conceived and developed.

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