2 Re-imagining Doctoral Writings as Emergent Open Systems

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Abstract: Drawing on critical realism, complexity theory, and emergence, this chapter supports the call to re-imagine doctoral writing by arguing that academic writing in general is a complex open and emergent social system that can change. Several reasons to re-imagine doctoral writing are discussed. The first reason is that academic writings[1] already exhibit considerable diversity. This suggests that the conditions of possibility for re-imagining them are already in place and provide a conceptual space from which to further imagine. Second, there are epistemic reasons for re-thinking how we write, as evidenced by research on socio-semiotics. Several examples of doctoral writers who have re-imagined their writing for epistemic reasons are given. To explain how change in social phenomena is possible and how it can continue to be justified, I draw on the theory of complex permeable open systems. These systems are emergent and, as such, allow us to think of social phenomena, such as writing, as non-reductive organic unities whose characteristics emerge from but cannot be reduced to any single constituent feature (such as grammar or lexis). By re-thinking academic writings in this way, we can provide a rationale to explain how they can continue to change. The chapter concludes by sharing the work of scholars engaged in re-imagining doctoral writings. The significance for writing studies is that critical realism offers a systematic and critical space within which to explain change in social phenomena and provides a theoretical foundation for continuing to re-imagine conditions of possibility.

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1   I intermittently use the plural—academic or doctoral writings—to signal or remind the reader that academic texts are varied. For example, there are traditional Ph.D. "big book" theses, but there are also Ph.D. theses by publication, which include several journal articles; art-based doctorates, which require an exegesis to critically explain a work of art; Ed.D. theses, which, in the UK, are typically shorter than the Ph.D. thesis; and several multimodal formats. Where I use the singular, I am simply reverting to standard usage.

> Imagination plays a crucial role in the making of pivotal educational features and phenomena, such as knowledge, inquiry, choice and deliberation, critical agency, meaning creation, forecasting, and, importantly, openness of possibilities.
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> – d'Agnese, 2017, p. 444

The question of whether doctoral writing ought to be re-imagined is a core concern that is addressed by this volume. To be sure, there are compelling reasons to resist the changes that any re-imagining of doctoral writing practices might entail. These include the perception that there is no need to change what already seems to be fit-for-purpose or that the risks of challenging the status quo outweigh the benefits. Yet, despite the reasons to resist change, bodies of literature on academic writing suggest an openness to re-imagining what is possible. These literatures range from scholarly blog entries (Mewburn, 2020; Thomson, 2015), to newspaper articles (Wolff, 2007), to systematic studies on the "conditions of possibility" of Ph.D.s (Fransman, 2012; Paré, 2018), all of which have investigated whether doctoral writings are "fit-for-purpose" (Mewburn, 2020; Paré, 2018). Together, these accounts have offered compelling reasons to challenge traditional practices and to extend how academic writing is "habitually understood," as the editors of this collection are encouraging us to do.

In this chapter, I support the call to re-imagine doctoral writings and do so by mobilising the sociological and philosophical notion of "open systems" (Collier, 1994), a notion that draws on complexity theory (Parnell, 2012) and critical realism (Sawyer, 2001). I begin by outlining two reasons why doctoral writings need to be re-imagined: The first is that there are several ways for academic writing to be "academic;" the second is that re-imagining how we write may broaden how we understand and represent knowledge. I then offer several examples of re-imagined doctoral writings and explain in what sense they are all academic and how they broaden the possibilities for epistemic representation. Next, I move on to explain that this re-imagining becomes possible when academic writings are conceptualized as a complex open system. The significance of this understanding is that open systems are permeable, meaning they are subject to change, yet also recognisable and stable (which is why they remain systems). I conclude with the hope that this theorisation can contribute to and support current and future re-imaginings of doctoral writing.

Reasons to Re-imagine: Family Resemblance and Epistemic Representation

Doctoral writings are part of a broader academic writing landscape. In this

sense, they are one of several academic genres, understood here as "conventionalised ways of acting and interacting" (Hamilton & Pitt, 2009, p. 63) that exhibit regularities and shared understandings of how language is used (Devitt, 1996).

There are several interrelated reasons for re-imagining doctoral writings beyond existing conventions and regularities. The first and overarching reason is historical in the sense that "what is seen as 'academic' writing is contestable and always emergent" (Archer & Breuer, 2016, p. 2). This claim suggests that there is more than one way for a text to be academic. It also provides the trigger for introducing the concept and property of "academicness" as a kind of "family resemblance"—discernible across time and (con)texts but not quite the same in each individual instance. The second reason is epistemic and accounts for why "innovation" (Tardy, 2016), "mobility" (Blommaert & Horner, 2017), "identity" (Ivanič, 1998), "multilingualism" (Canagarajah, 2002), and evolving professional contexts (Mewburn, 2020; Paré, 2018) warrant changes in form. The epistemic reason underpins much socio-semiotic research, which has called for greater multimodality in writing practices (Archer & Breuer, 2015; Kress, 2010) and, more generally, in higher education (Andrews et al., 2012; Archer & Breuer, 2016). This research is important because by extending the concept of writing beyond language and also beyond monolingualism, socio-semiotic research suggests that diverse knowledges can emerge when writing is multimodal. These include the knowledges of the so-called "peripheral" European and Global South contexts (Bennett, 2014; Collyer et al., 2019; Thesen & Cooper, 2013) as well as the knowledges of oral cultures, whose meanings, sounds, and rhythms vanish when transcribed into standard academic writing, as evidenced by A. D. Carson's thesis *Owning My Masters: The Rhetorics of Rhymes & Revolutions* (https://phd.aydeethegreat.com/) (Carson, 2017).

A further reason to re-imagine doctoral writings relates to writer intent, namely what writers wish to achieve with their writing. This reason acknowledges that writers have choices, goals, literacies, histories, and values that warrant their autonomy in shaping how they write. In what follows, I offer a fuller account of these reasons to re-imagine doctoral writing.

Family Resemblances and Academicness: What Doctoral Writings have in Common

Notwithstanding their complexity and diversity, doctoral writings share the property of "academicness." One way of thinking about academicness is in terms of "family resemblance" (Wittgenstein, 1953), whereby we acknowledge

that there is no common distinguishing feature that characterises a member of a family, yet we recognise each member as belonging to that family. The theory of family resemblance has been mobilized across a range of disciplines, including aesthetics (Weitz, 1956), the history of science (Daston & Galison, 2007) and genre (Fishelov, 1991), because it provides a conceptual tool for classifying artefacts (including texts) according to commonalities without eclipsing their diversity and uniqueness.

Ludwig Wittgenstein's (1953) theory of family resemblances was originally articulated to explain how games as vastly different as chess, solitaire, or football have enough in common to warrant membership in a single "games family." Similarly, thinking about academic writings as belonging to a family that has "academic" resemblances can be generative because it allows us to accept similarities and differences in purpose, conventions, and form.

Academicness is also a property of texts that can be described philosophically as an organic unity (Allen, 2003) because it is holistic and non-reductive. This quality can be predicated of *whole* texts in such a way that does not pick out any single or uniquely identifying *part* of the whole. Moreover, and because of its holistic qualities, academicness cannot be reduced to any single feature of a text. This non-reductive way of thinking about academicness can help re-imagine the conditions of possibility by opening a space within which to consider a wide range of features that might contribute, holistically, to academicness. For example, what might make a text academic is not the use of any prescribed lexis or form, such as the five paragraphs of the traditional essay (Warner, 2018) or the default IMRAD (Introduction, Methods, Results, Analysis, Discussion) thesis sequence (Paltridge & Starfield, 2007). Rather, what makes a text academic are the ways in which it adheres holistically, as a whole, to specific socio-academic practices (Molinari, 2019).

Socio-academic practices are the social practices (Schatzki et al., 2001; Lillis et al., 2015) that relate specifically to the academy. They include acknowledging the work of others, providing evidence, arguing, and developing a stance. Socio-academic practices are underpinned by epistemic virtues, namely the social and human values that generate the practice (Harding, 1995; Wylie, 2003). These practices and their underlying values include commitments to objectivity and trained judgment (Daston & Galison, 2007), truth or truthfulness (Connell, 2013), academic integrity (Zgaga, 2009), social justice (Case, 2013), innovation and research (Warnock, 1989), and creativity (Besley & Peters, 2013).

When writers (and, by extension, their texts) are committed to socio-academic practices and epistemic virtues rather than to a display of form, they are more likely to mobilise a wider range of semiotic resources. This is because

when academicness is conceived as a non-reductive property of texts, as I showcase next, there is no single a priori semiotic resource to enact it. What this means is that an image, sound, or movement (Roque, 2015) can confer academicness to a text.

Troubling Epistemic Representation: The Tussle of Form and Intent

Within its family of resemblances and in the context of academicness, what distinguishes doctoral writings from their academic "siblings" is their genre and purpose, by which I mean form and intent, respectively. For example, a doctoral thesis is longer in form than a master's dissertation, and its intent, or purpose, differs in terms of the requirement to produce "original research":

> A thesis is a typewritten manuscript, usually 100 to 400 pages in length, in which the student addresses a particular problem in his [*sic*] chosen field. [It] is a piece of original research, in which one must not only know the work of other scholars but also "discover" something that other scholars have not yet said. (Eco, 2015, p. 2)

Umberto Eco's purpose here is to simply provide a working definition of what a thesis is. However, it also allows me to highlight a historical and technological contingency: Before the typewriter, other technologies facilitated writing (Kelly et al., Chapter 10, this collection, also explore this topic). Since the typewriter, new technologies have emerged, each affording epistemic "losses and gains" (Bezemer & Kress, 2008) that can "rattle the information chain" (Bazerman, 2015). With each technological change, possibilities emerge for re-thinking how we write, what we even mean by "writing" (Harris, 2000), as well as what kinds of knowledge writing allows us to communicate (Olson, 1996). What this suggests is the possibility that knowledge need not be "typewritten" (or even written) any more than it needs to be constrained by genres and linguistic forms that have been described as "straightjackets" by Mary Hamilton and Kathy Pitt (2009) and as "pigeon-holes" by Moragh Paxton (2013). It further suggests that writers have agency in how they wish to represent knowledge because technological affordances are varied and offer possibilities rather than constraints.

Equally, academic writings do not need to be the kind of epistemological "frauds" admonished by Daniel Shanahan (2015) and by Christiaan Vinkers et al. (2015), who have highlighted how the form of the scientific article can distort the integrity of scientific practices. This happens when writers and

publishers foreground findings to inflate their significance. The requirement to foreground findings (e.g., in the abstract) signals a commercial need to be "competitive" rather than the epistemic virtue of sharing scientific methods. In addition, the use of superlative language can aggrandise results. The claim that this kind of scientific writing is "fraudulent" exemplifies what Charles Bazerman (2015) may have had in mind when he claimed that certain forms of scientific academic writing "encapsulate" and "chain" knowledge to the interests of "university departments and businesses" rather than to the advancement of knowledge (p. 267); the "fraud" becomes manifest through the form of writing.

Taken together, what the above technological and textual affordances signal is that academic writings are already varied in form and writer intent. This offers scope for further variation, ensuring that new and diverse socio-academic practices and epistemic virtues continue to emerge. Since knowledge is complex (Parnell, 2012), reducing its representation to one modality or genre is epistemically troubling (Atkinson, 2013; Thomson, 2018).

Epistemic representation has been a troubled endeavour throughout the history of science (Daston & Galison, 2007). This troubled positioning has been highlighted by writing scholars, such as Brian Paltridge and Sue Starfield (2007), who described the effect of linguistic choices on epistemic representation as follows: "Academic writing is typically viewed as largely depersonalized. Textbooks tell students that for scientific writing to be objective, it should be impersonal and use the passive voice—thus removing or reducing the presence of the researcher in the text" (p. 29). Here, they have described how the use of the passive voice affects how knowledge is represented.

A further challenge of representing sociological knowledge runs throughout John Law's 2004 book, where he lamented the "messiness" of qualitative research because it defies the linear representations required by traditional academic writing. Similarly, sociologist Howard Becker (2017) foregrounded the disproportionate effect of using the passive to describe social phenomena. In his blog entry, Becker admonished academic sociology journals for insisting "on the most academic prose, for no reason that anyone can explain very well" (para. 6); he also noted, "Stylistically, this flattens the prose, makes it dull and boring to read" (para. 5).

My discussion, so far, has highlighted that if the positionality of the researcher can change how knowledge is represented in a text, then there may be further triggers for renewed imaginings because writers are agents who have intentions and goals and who can initiate change. Indeed, there is evidence of such triggers in how scientific writings have historically been re-shaped and

re-imagined to reflect the epistemic virtues and social values of their time (Bazerman, 2000; Gunnarsson, 2001). This history offers further insights into the conditions of possibility that can allow us to continue re-imagining doctoral writings as contested and emergent, as I exemplify next.

Evidence of Doctoral Writings Re-imagined

In this section I will present evidence of doctoral writers who have grappled with how to represent their knowledge and, as a result, have re-imagined doctoral writing texts. I present these examples with the knowledge that this is not solely a contemporary concern. For instance, we might look to the case of Ludwig Wittgenstein (2010), whose thesis (later published as *The Tractatus Logico-Philosophicus*) was imagined and written as a series of aphorisms "reflecting the tension between his yearning for clear expression and his awareness that some things simply cannot be expressed" (Sigmund, 2017, p. 128); the result was an attempt to represent non-metaphysical reality as though it were crystal clear." Each of the following examples shows that "imagination plays a crucial role" as signalled in the epigraph by Vasco d'Agnese (2017) that opened this chapter.

Owning my Masters

A. D. Carson's 2017 musical Ph.D. dissertation, *Owning My Masters: The Rhetorics of Rhymes and Revolutions* (https://phd.aydeethegreat.com/), includes a timeline of social and racial movements on his university campus, a blog, music videos, and transcribed lyrics. At his defense, he performed four of his songs and showed one music video (Zamudio-Suaréz, 2017). His intent was both academic and political, aimed at satisfying "the committee but also [at sparking] a larger discussion about race, hip-hop culture, and activism" (Zamudio-Suaréz, 2017). His thesis can be said to enact the socio-academic practice of social justice (Molinari, 2019).

Unflattening

Nick Sousanis' comic Ed.D. dissertation, which was later published in book form as *Unflattening* (2015), challenged the linearity and flatness of "Western" thinking and advocated interdisciplinary approaches to knowledge. This was done using illustrations to argue multimodally (cf. Gilbert, 1994). Sousanis' (2015) claim was that when academic argumentation is reduced to linear styles, including the ways it occupies page space, it risks flattening and

narrowing perspectives on and opportunities for referring to the world. His research can be said to embody Rudolf Arnheim's (1969) epistemic virtue of interdisciplinarity and visual thinking. Sousanis' (2015) rationale for drawing his arguments is rooted in a rhetoric of visuals that can "prompt sustained reflective thinking" (Hill, 2004, p. 38) by removing the walls that words create (Sousanis, 2018).

The Equidistribution of Lattice Shapes of Rings of Integers . . .

Piper Harron's (2016) playful feminist Ph.D. dissertation on mathematics was written in three different registers and for three different readers: the lay person (elementary knowers), the initiated person (secondary school maths teachers), and the expert (her examiners). She chose who she wanted her readers to be (exerting her agency and intent as a writer). She anticipated and oriented her readers' expectations by disrupting the genre of the Ph.D. thesis that assumes one type of reader (the examiners) and shared understandings of what mathematics is and who it is for. She did this because she wanted to write a thesis that was "as mathematically complete as I could honestly make it" and for a community of mathematicians who "do not feel that they are encouraged to be themselves" (Harron, 2016, p. 1). By interacting with what her textual environment afforded (in terms of language and register) and by re-imagining the form her Ph.D. thesis took, she enacted the socio-academic practice and epistemic virtue of inclusion and social justice.

Writing the Thesis in Languages Other Than English

Hleze Kunju (2017) wrote his thesis in isiXhosa, one of South Africa's eleven languages. In so doing, he enacted an ideological stance that consisted of re-claiming an Indigenous language as academic and challenging what has been pointed out as the dominant geopolitics of academic English (Lillis & Curry, 2010; Politzer-Ahles et al., 2016). Similarly, Peruvian doctoral researcher Roxana Quispe Collantes wrote and defended her thesis in Quechua, the main language of the ancient Incan Empire (Collyns, 2019; Jones, 2019). By writing in isiXhosa and Quechua, respectively, both researchers were "enacting and creating identities and ideologies" (Roozen, 2015, p. 50) as agents who recognised the affordances of their textual environments (English, 2011; Williams, 2017).

The above examples show that doctoral writings are already being re-imagined with the intention of broadening epistemic representations and values.

They signal that researchers and their supervisors already question the conventions that Lucia Thesen and Linda Cooper (2013) have cautioned against:

> "How to Books" on academic writing . . . tend to over-generalise, over-simplify, de-skill students, . . . implicitly and explicitly perpetuating a restricted and deficit model of student competence and language use. The guides . . . tend to focus on how students can imitate existing conventions based on massively problematic assumptions about student homogeneity and the stability of the disciplines. (p. 4)

The reason why "homogeneity and . . . stability" are "problematic assumptions" is that, as we have just seen, doctoral researchers and their intents are heterogenous, as are the socio-academic practices and epistemic virtues that underscore their research. Such heterogeneity is likely to warrant further re-imaginings.

Academic Writings as "Open Systems": Toward a Critical Realist Perspective

To explain why doctoral writings are and can continue to be re-imagined, I draw on theoretical frameworks that are not established in current academic writing literatures. They are, nonetheless, relevant. These include the philosophy and sociology of critical realism as well as complexity theory and open and emergent systems (Collier, 1994; Kuhn, 2008; Larsen-Freeman & Cameron, 2008; Mason, 2008; Parnell, 2012; Sawyer, 2001), all of which underpin critical realist philosophy. These theories complement established studies on academic writing by making explicit the social ontologies and epistemologies that underpin social practice theories of writing (see van Schalkwyk & Jacobs, Chapter 4, this collection). After introducing these theories, I outline their relevance to the project of re-imagining doctoral writing.

Critical Realism: A Philosophy of Change

Critical realism is a philosophy of social science associated with Roy Bhaskar (1989, 1998) and further developed by Margaret Archer (1995, 2000, 2003; Archer et al., 1998). It has roots in Kantian metaphysics and Marxist materialism. Its ambition has been to transcend positivist accounts of social reality, on the one hand, and constructivist ontologies, on the other. This is because, critical realists have argued, both these theoretical frameworks are inadequate to explain social phenomena. Positivism fails because it reifies objectivity by

purporting to make value-free judgments about the nature of reality; it also favours deterministic and mechanistic explanations that undermine agency. Constructivism is inadequate because it tends to relativise judgements about what counts as real (Collier, 1994), potentially undermining social reality by over-emphasising the role that agents play in constructing it. Instead, critical realists have argued that ontological claims about the reality of social phenomena (such as social structures) are justified because social reality is not a construct, it is real. At the same time, the reality of the social world is shaped by and can be changed by individuals (agents). Critical realists have argued that individuals, including scientists/researchers, do not simply *describe* the world, they judge it through value claims. These value claims are what enable individuals to then intervene *critically* in changing social reality.

This emphasis on *critical* social intervention is relevant to re-imagining doctoral writings because it affords the conditions of possibility that are needed for changes in writing practices to emerge. We know from research on academic literacies that academic writing is a *social* practice (Lea & Street, 1998; Lillis & Scott, 2007). In this sense, it is a real social phenomenon governed by structures (e.g., rules and conventions) that bind writers. A critical realist lens, however, emphasises that writers have agency to intervene, re-imagine, and change those structures. Writing scholars who have argued along these lines include Donald Judd (2003) and Deirdre Pratt (2011). Researchers working in the field of higher education have included Jennifer Case (2013) as well as Chrissie Boughey and Sioux McKenna (Boughey & McKenna, 2021), all of whom work or have worked in South African and post-Apartheid education. The uptake of critical realist theory in educational contexts affected by systemic inequalities of access is particularly worthy of note because it indexes the generative and transformative potential of the theory.

Three inter-related concepts that are especially relevant to this discussion underpin critical realist philosophy. These are complexity theory, open systems, and emergence. Understanding each one in connection with the other can help re-imagine the social structures that shape doctoral writings in ways that are non-reductive and non-deterministic, thus opening possibilities for enacting change in doctoral writing.

Complexity Theory

Complexity theorists argue that the behavior of a whole is distinct from the behavior of the individual parts that constitute that whole. Because of this, complex reality is referred to as non-linear since it cannot be straightforwardly explained by reducing it sequentially and mechanistically to a finite set of

causes (Larsen-Freeman & Cameron, 2008; Mason, 2008; Parnell, 2012). This is what makes reality complex as opposed to complicated. A sailor's knot is complicated but not complex because it is possible to mechanically trace the sequence of steps that created the knot in a way that is linear, where each step adds up to determine and predict a final outcome. The chemical formula for water (H_2O), on the other hand, is complex because the characteristics of the whole—a liquid—are both quantitatively and qualitatively distinct from the characteristics of its constituent elements—gases.

The significance of complex non-linear explanations is that they exemplify how novel phenomena, such as liquids, emerge from qualitatively and quantitatively distinct constituents, such as gases. Novelty becomes possible because what causes a complex phenomenon is disproportionate or not comparable to the phenomenon itself (Ball, 2004). This can be illustrated with reference to social phenomena such as crowd behavior, the reality of which, as a whole, is disproportionate to its cause(s) or constituent parts. For example, crowd behavior is often characterized by its roaring noise, threatening mass, and unstoppable momentum. Yet, this reality is distinct from the behavior of any single individual that constitutes the crowd. Although individuals cause the crowd to exist in the sense that crowds are made of individuals, the crowd's behavior and characteristics are distinct from those of any specific individual. The crowd's *roar* or *threat* cannot be reduced to the *cries* or *protests* of any single individual. Rather, the crowd's behavior *emerges* as distinct from the interaction of multiple variables that are not individually responsible for the noise or danger generated by the whole (such variables include police blocks, the weather, or a single person, each of which, as a single variable, neither "roars" nor "threatens").

Similarly, if academic writings are understood as being social practices, then they can be classified as complex phenomena. This is because texts are made up of parts—such as lexis, grammar, paragraphs, moves, or conventions—that form a whole—such as a social, cognitive, or activity-oriented genre (Bruce, 2008; Hyland, 2002a; Russell, 1997). This *whole* behaves and is perceived in ways that differ to those of its constituent *parts*. For example, the arguably innocuous personal pronoun "I" can have a disproportionate overall effect on the writing as a whole. It can make a text as a whole seem subjective or informal (Bailey, 2006) and potentially lead to unintended consequences, such as undermining the objective undertaking of somebody's research. Yet, the use of "I," in and of itself, does not make a text inherently subjective. Rather, what confers a subjective feel or voice to a text is the range and interaction of rhetorical and discursive devices with shared disciplinary conventions and understandings (Hyland, 2001, 2002b; Matsuda & Tardy, 2008; Tang & John,

1999). In this sense, the holistic subjective quality of a whole text cannot be reduced to any single textual feature, including the use of "I."

Moreover, because of their non-linearity, complex systems make it harder to predict the effect of any given cause, such as a linguistic choice, or to isolate a single cause as being responsible for any given effect, such as the subjectivity or objectivity of a text. Rather than a mechanistic aggregate composed of concatenated parts that add up to a whole—as cookie-cutter (Bazerman, 2000, p. 8) and template (Nesi & Gardner, 2012, p. 2) approaches to writing encourage—social practice framings of academic writing are dynamic and transformative systems where multiple variables interact to allow diverse texts to emerge (Lillis, 2013). These interactions have multiple causes that cannot be reduced to constituent parts in any linear, mechanistic manner. What makes Harron's (2016) thesis academic as a whole, for example, cannot be traced back in a linear way to any specific parts of it, such as the words or arrangement of her text. Instead, what makes her text academic are a range of inter-related socio-academic variables and epistemic virtues that ensure her thesis adheres to rigorous academic standards.

Open Systems and Emergence

The complexity described above is related to a notion that is fundamental to critical realism: the notion of open systems and what emerges from them. Open systems are characterized by multiple variables and interactions that enable new phenomena to emerge (Fodor, 1974). A human body is an open system: It emerges from countless variables and their interactions. Once a whole phenomenon has emerged (i.e., a social, political, psychological human being, not just a biological body), it can no longer be reduced to and identified with any one of its physical constituent parts (e.g., body shape).

Another way of understanding open systems is to compare them to closed ones (Collier, 1994). Closed systems are artificially created conditions designed to isolate mechanisms so they can be observed in the absence of putatively irrelevant causal variables. For example, if I want to know what causes light to refract, all I need is a source of light and a medium through which it can pass, such as a prism. I do not need trees, houses, rain, or anything else that co-occurs *naturally* when light refracts in the environment because these elements are not causally relevant to the refraction of light.

Doctoral writings, similar to human beings, however, *are* characterized by naturally co-occurring events. They are open to variables that have causal relevance. These variables include the purposes, languages, values, and literacies of researchers (the agents) as well as myriad environmental structures (e.g.,

socio-academic practices, epistemic virtues, institutional conventions and constraints). In this sense, academic writings are not closed texts. However, an International English Language Testing System (IELTS) essay could be described as closed because all it needs to be successful are isolated features, such as standardized paragraphs or linguistic devices, that do not reflect the naturally-occurring influences that shape academic writing and affect language choice, such as disciplinary genres, citation practices, and voice (Ivanič & Simpson, 1992).

In her insightful re-imagining of the "conditions of possibility for the Ph.D.," Jude Fransman (2012) likened open systems to maps because they afford the "organisation of reality" rather than "the reproduction of a prior organisation," explaining, "The map is . . . detachable, reversible, susceptible to constant modification. It can be torn, reversed, adapted to any kind of mounting, reworked by an individual, group or social formation" (p. 140). This suggests that because they are not determined by a single use or purpose, maps are open to change.

A critical realist understanding of open systems might echo Fransman's (2012) reference to maps in so far as open systems are "susceptible to … modification" (p. 140) because they are permeable. This means energy and matter can be exchanged between the system (e.g., the writing) and its environment (e.g., prevailing conventions or society) whilst preserving the identity of both the system and the environment. Naturally occurring phenomena, such as rivers, cells, and humans, are examples of open systems because they are self-contained, but they are also susceptible to modification by their environments. Their identity as rivers, cells, and humans remains constant and recognisable, but their forms and purposes can change as they interact with their environments. Their identities can be said to *emerge* from this interaction. Similarly, the identities of doctoral writings can remain constant and recognizable despite changes in their form and purpose (cf. earlier reference to family resemblance).

Emergence, here, is a key concept that is powerful and generative for re-imagining writing. This is because it enables us to talk meaningfully about conditions of possibility, novelty, and change. A simple way to understand this concept was offered by philosopher Jaegwon Kim (2006): "A purely physical system, composed exclusively of bits of matter, when it reaches a certain degree of complexity in its structural organisation, can begin to exhibit genuinely novel properties not possessed by its simpler constituents" (p. 548). The literatures on emergence theory are too vast to summarise here (see, for example, Ablowitz, 1939; Chalmers, 2008; Sawyer, 2001; Taylor, 2015). What they have in common and is relevant to this discussion is a concern

with how novelty, both social and physical, can be explained in ways that are non-reductive and non-deterministic. When novelty is explained in this non-deterministic way, it can create conditions of possibility that then lead to change, with change being key to critical realist philosophy. Since a concern with change is also central to re-imagining doctoral writings, further research in this area might offer fresh insights into how theories of emergence could provide a foundational and generative conceptual toolkit for their ongoing re-imagination.

Re-imagining doctoral writings as open systems would allow them to be conceived as emergent socio-academic practices that represent a wide(r) range of epistemic virtues. This would warrant drawing on the representational affordances of a far broader and diverse socio-semiotic landscape.

Making it Happen: Communities of Support

Doctoral researchers do not work in isolation. Their agencies interact with those of their supervisors who operate within established university structures and expectations. This can be a challenge when it comes to re-imagining doctoral writing. However, just as there are established standards and conventions, there is an equally established and growing community of scholars who can provide the inspiration, solidarity, and tools with which to re-imagine. I hope that my theorization of academic writing as an emergent open system can contribute to the conceptual foundations that already underpin the important work of this community.

The community of support includes Fiona English (2011, 2015), whose socio-semiotic reconfiguration of written knowledge has drawn on the work of Gunther Kress and extended it to provide examples of how academic writers and those who support them can "re-genre" (2011) their work in creative and critical ways. In Thesen and Cooper's (2013) edited collection, authors showcased examples of how doctoral writers and their supervisors negotiated choices for representing knowledge. They highlighted both the tensions and possibilities that emerge from this process, particularly within the multilingual and multi-literacy spaces that characterize South African higher education. The work of independent scholar Helen Kara (2015; Kara & Brooks, 2020; Phillips & Kara, 2021) is also relevant to the project of re-imagining how research gets written. In her works, Kara has highlighted the value of creative research methods in representing Indigenous knowledges and in broadening our understandings of ethical practices. And last but not least, there is the work of Dely Lazarte Elliot et al. (2020), who have described doctoral research as a landscape of hidden opportunities and constraints that

affords exploration, digression, and innovation. The conditions of possibility available in this landscape are further evident in Catherine Manathunga's (2020) blog entry on decolonising doctoral writing; as Manathunga explained in her entry, she drew explicitly on Boaventura de Sousa Santos' 2014 idea of "sociologies of emergence" (as cited in para. 1) to make the case for re-imagining how doctoral researchers write and what they write about. She also included several examples of re-imagined theses.

Concluding Thoughts

The reasons to re-imagine doctoral writings discussed in this chapter can be summarized as follows: First, academic writings already exhibit considerable diversity, even within their family resemblances (Wittgenstein, 1953) and across their shared property of academicness. This suggests that the conditions of possibility for re-imagining academic writing are already in place and afford a conceptual space within which to imagine further. Second, there are epistemic reasons for re-thinking how we write. These include the fact that semiotic choices affect the representation of socio-academic practices and epistemic virtues. Several examples were given in this chapter of doctoral writers who have re-imagined their writing for these reasons.

Drawing on the philosophy of critical realism and its framing of complex open systems as emergent, I suggested how and why change in academic writing continues to be possible. I argued that when academic writings, of which doctoral writings are a part, are conceived as permeable and emergent open systems, they can change and adapt in response to the intentions of their authors and to the environments to which they belong. I concluded this chapter by sharing the work of scholars who are already nurturing a community of writers actively engaged in re-imagining doctoral writings.

The significance of this chapter for doctoral writing researchers is that critical realism provides a systematic and critical space within which researchers can explain changes in social phenomena, which include doctoral writings and affords a theoretical foundation for continuing to re-imagine conditions of possibility.

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