

Rethinking Complexity in Border Studies

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ABSTRACT

Although references to complexity have become increasingly common in border studies, complexity often remains a vague metaphor rather than an analytical concept. Drawing on complexity theory, the paper proposes a refined framework that distinguishes between a complex *order of the border* (the internal structuring of bordering process elements) and a complex *gestalt of the border* (the emergent capacity to become visible and act as a border). Building on these analytical categories, the paper advances methodological principles for complexity-oriented border research, offering a novel heuristic for analyzing borders as complex composites characterized by non-linearity, interrelationality, and emergence.

KEYWORDS

border theory; complex systems; relationality; border complexity; methodology

1. Introduction

While borders are increasingly described using simplistic formulas in public discourse, in border studies, the idea that borders are complex has prevailed. References to “complexity” in border studies are not new, as evidenced by a query of the digital online archive of the Journal of Borderlands Studies, which yielded 788 hits (March 26, 2025). Since the 2010s, however, references to complexity have proliferated significantly. This paper critically discusses this “complexity shift” (Wille 2021, 2024) and demonstrates how the demand in border studies to think and study borders as complex phenomena can be effectively addressed.

Currently, there are only a few works that attempt to conceptually clarify the relationship between borders and complexity and to make it methodologically accessible (Banse 2018; Bossong et al. 2017; Brambilla 2023; Cyrus 2024; Gerst 2024; Gerst et al. 2018; Little 2015; Wille 2024; Zhang, Hu, and Williams 2023). Rather, numerous ideas are circulating about what is complex at and with borders, which are often combined with preconceptions that overlook the original meaning of complexity. To identify these works, several fields in border studies were taken into account: We analyzed references to and conceptualizations of complexity in the fields of borderlands and border regions

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(Gelbman and Timothy 2011; Paasi 2012; Haselsberger 2014; Joyce 2017; Lynnebakke 2020), migration and security (Amilhat Szary and Giraut 2015; Banse 2018; Basilien-Gainche 2024; Burrige et al. 2017; Côté-Boucher, Infantino, and Salter 2024; Nail 2016; Nieswand 2018; Teunissen 2020), borders and ecology (Kumar Mahla 2024; Thomas 2017; Zhang, Hu, and Williams 2023) and several dimensions of the border (Bürkner 2019; Laine 2017; Little 2015; Pötzsch 2015; Schindel 2022). The review of these works reveals that complexity has become a common category of description for current borders and border phenomena. This suggests that, in most cases, complexity serves as a metaphor and remains under-defined. Without a notable theoretical foundation, it is often used to describe constellations or relationships that constitute a border or are related to it. Likewise, without further clarification, something is often declared to be complex that appears “opaque”. This observation is supported by Morin’s (2007, 6) general criticism: “[C]omplexity [...] usually means confusion and uncertainty; the expression “it is complex” in fact expresses the difficulty of giving a definition or explanation.”

Against this background, we can discern different interpretations that come into play when discussing complexity, referring to the widespread understandings of the concept. Thus, a complexity of borders is often diagnosed when, firstly, a specific mixture of b/orders can be described at different levels. The complexity of the border is justified here by its multiscalarity and the relationships that extend across different scales. Second, a diffusion of the border into different elements is often addressed by complexity. Here, the guiding insight is that the border is not only a physical line, but (also) acts by means of identity documents, databases, linguistic categorizations, jurisprudence, etc. Third, complexity is often situated within the border when considering it as a multidimensional entity. Here, various elements of the bordering process (bp) form a connection that can be understood, for example, as a border regime. Fourthly, complexity is often located where border conflicts occur and where they refer to specific agonalities. This is often referred to as an in-betweenness, which is formed from complex references in the interspace of the border.

This overview of works and circulating understandings shows that current border studies employ a complexity-oriented vocabulary, but with vague foundations of complexity. As a result, the concept is in danger of losing its explanatory potential and becoming merely a rhetorical device. Furthermore, border studies currently lack appropriate tools to systematically conceptualize borders as complex and to empirically investigate them as complex phenomena. This paper addresses this gap by reminding border scholars of the conceptual foundations of the complexity notion and proposing a heuristic framework that integrates complexity as an inherent feature of bp. The argument unfolds in three steps: The first step is to discuss, in light of recent developments in border studies, major trends since the bordering turn that explain the raise of the complexity discourse, which is (still) largely grounded in what may be termed a “supposed complexity”. In the second step, complexity theories will be introduced to conceptualize borders as complex composites that reveal *borderness* emergently. Analytically, we introduce a distinction here between a complex *order of the border* – as an internal structure(-ing) of interrelational bp elements – and a complex *gestalt of the border* – as an emergent capacity of a border composite. Finally, we discuss the implications these considerations have for a research process that takes complexity seriously, particularly in its conception

and methodology. Methodological principles will be developed that mediate between theoretical assumptions and empirical work, guiding complexity-oriented border research.

2. Developments towards complexity thinking

The following overview shows how, in border studies, the boom of the concept of complexity and its disparate uses evolved through recent conceptual and methodological developments. In different ways, they reflect the tendency to analytically classify and empirically consider the elements, dimensions, resources or actors that play a role *in* and *for* borders. The origin of this was the bordering turn, which border studies experienced around the turn of the century. It represents the view that borders are constructed and dynamic products as well as producers of social and cultural processes (Newman 2003). This epistemological realignment, which is also often discussed as the processual shift, is based on the assumptions that borders are continuously reproduced (in the process of becoming), emerge from an achievement of order (ordered), create order (ordering), and are effective (political) (Wille 2021). For this change of perspective, early work by van Houtum and colleagues was influential, as they worked out the relationship between bordering, ordering, othering, and spacing (Van Houtum and van Naerssen 2002; Van Houtum, Kramsch, and Zierhofer 2005). Border studies has been working with the process-based understanding of borders for over twenty years now (Forum 2021) and various appropriations and derivatives have emerged, which reflect the ongoing effort to conceptually refine bp.

These efforts include further developments that multiply the perspectives *on* and *through* bp. Thus, it was pointed out early on that different actors are (simultaneously) involved in bp. This can be seen not only in the control and filtering practices of migration management, which associates multiple actors from different countries (Ellebrecht 2020). The role of “[o]rdinary people” (Rumford 2012, 897) and their agency in bp is also discussed as “vernacular borderwork,” i.e. as “the effort of ordinary people leading to the construction, dismantling, or shifting of borders.” (ibid., 897) The consideration of the actors’ diversity not only has the consequence that bp are understood as a (contested) amalgam of the agency of multiple actors. In the same way, it also implies a multi-perspective view that allows different voices to speak and makes once-invisible actors visible.

A multi-perspective view has also prevailed where the social arenas of bp are called into question. After all, these can rarely be situated exclusively on a specific scale or within a particular social field. Rather, they are multiple and diffuse. In this context, Rumford (2014) speaks of borders as “increasingly messy” (ibid., 16) and describes bp as “an untidy collection of activities and sites of action littered across society” (ibid., 16). This view overcomes the idea that bp are exclusively located in the political or security field, and opens up perspectives on multiple social fields (at the same time). This more-extensive approach implies multiple methodological observational positions and makes it possible to take into account the “‘big stories’ of the nation-state construction” and “the ‘small stories’ that come from experiencing the border in day-to-day life” (Brambilla 2015, 25). A “multi-perspectival study of borders” (Rumford 2012) also takes place when thematic distinctions are made and thus bp are conceived multidimensionally (i.e. the spatial, material, technological or temporal dimension). In addition to

the differentiation according to individual dimensions, there are also attempts to understand bp as an accumulation of dimensions in order to detect the “thickness” of borders (Haselsberger 2014).

Whereas concepts such as multi-perspectivity and multidimensionality reflect border studies’ engagement with uncovering multiple variations of bp, a further development within the bordering paradigm addresses the spatial–temporal conditions of bp. It is about the tendency to think of such processes as ubiquitous and mobile (Balibar 2002), whereby bp are no longer located at the traditional place of the border, but are distributed trans-territorially, figuring in different places at the same time, and in variable constellations. Nail (2016) thus describes mobility control as a differentiated and deterritorialized constellation in which, for example, the wall, the cell and checkpoints are intertwined into a bordering apparatus that floats spatially. This view on bp has replaced the supposed unity of territory, state, and nation (White 2004) in favor of a polycontextual and relational idea of the border.

While the idea of the spatial–temporal diffusion of the border produced a great deal of research, it also paved the way to think of bp as spatially distributed and temporally divergent, but coherent structures. As conceptual developments suggest, borders are composed, for example, of practices, discourses, bodies, objects, artifacts, knowledge, etc., which are related to each other in a way that is often referred to as complex. This has been formulated in various ways, and thus far, also conceptually rather vaguely, as seen in the Ethnographic Border Regime Analysis. It attempts to view bp “as a structure made of a multitude of actors, institutions and other human and non-human factors and practices, without simplifying the various interests and rationalities of these forces into a simple linear logic or a hidden agenda” (Hess and Schmidt-Sembdner 2021, 201). In a similar vein, the borderscapes approach describes bp as “constructed spaces” “that, far from being fixed in space and time, are constantly evolving” (Brambilla 2015, 23). The bordertextures approach also follows the composite idea and understands bp as dynamic textures that consist of interwoven activities, discourses, objects, bodies, and knowledge and in their interplay produce or challenge borders (Fellner 2025; Weier et al. 2018). Finally, the idea of understanding bp with Deleuze and Guattari (1987) as an assemblage (Sohn 2016; Teunissen 2020) also represents this sensitivity for the composite character of bp. It allows the relational constellations of the process elements involved to be thought of as diffused, always preliminary, and as dynamic multiplicities.

A final development emanating from the bordering turn which we want to highlight here is concerned with methodological considerations. At its core, this development refers to the tendency of researchers to analyze bp from an immersive position. This is not about examining at borders and their effects from the outside, but about making bp themselves the “site of investigation” (Parker and Vaughan-Williams 2012, 728). The reason for this is the assumption that such processes have an inherent and powerful ordering logic, which is expressed in the organization and mechanisms of the relationships and (dynamic) constellations of the multiple process elements. This internal logic stands for the infrastructure(ing) of bp and provides insights about how they “work.” The introspecting of borders as a methodological approach aims to explore borders as internally structured, which are often declared to be complex: “borders themselves are intrinsic complex orders” (Bossong et al. 2017, 77). Approaches that are based on such an internal viewpoint are, for example, “border as method” (Mezzadra and

Neilson 2013), “seeing like a border” (Rumford 2014), “border praxeology” (Connor 2025; Gerst and Krämer 2017), or “border knowledge” (Gerst 2020). Despite their specific focus areas and disciplinary groundings, these approaches reject an externalized perspective on borders and share an immersive observational position that approaches bp “through the border” (Mezzadra and Neilson 2013).

The developments presented show efforts to analytically differentiate bp. This replaced simplifying and reifying ideas of border studies with a holistic understanding, contributing to the growing popularity of the concept of complexity. However, current border studies works with a vague concept of complexity. This is because acknowledging the multiplicity and diffuseness of bp is essentially restricted to determining multiplicity through an analytical breakdown of the actors involved, process elements and their social or spatial distribution, as well as foregrounding the question of which “border variations” (Brambilla 2015, 25) result from them. Here, multiplicity and multiperspectivism merge into plurality, which thus often suggests a “supposed complexity”. However, they do not provide insights into how bp actually work in a complex manner – i.e. how the identified multiplicities interact and thereby constitute *borderness*.

Multiperspectivism and multiplicity thinking emphasize the relational and dynamic relationship of the process elements, which is central to complexity thinking, but is not often defined conceptually (or empirically) in more detail. Only occasionally is mention made of inclusive or complementary relationships, for example, when borderscapes are discussed as a suitable approach to link analytically political visions to everyday practices (Laine 2017, 14; Scott 2017, 16). Rajaram and Grundy-Warr (2007, xxvi) as well as Brambilla (2015, 29; 2021, 14) emphasize that relationships must be recognized as particularly tense and controversial in order to gain appropriate analytical access to bp. Furthermore, a disruptive potential is attributed to the relational connection of the process elements which is intended to qualify the composite character of borders as spaces of possibility. But here, too, there is an insufficient explanation of how and why alternative realities (can) unfold from the relationality of bp. Despite their conceptual importance, “‘relationality’ as a crucial feature of the border” (Brambilla 2021, 12) apparently remains under-defined in current border studies. Understanding borders as composites therefore often amounts to conceptual black boxes in which multiple process elements carry out borderwork together and in a manner that is apparently difficult to determine – and therefore is often grasped as supposedly complex. Insights into such black boxes can be provided by an introspection of borders, which allows access to the “internal structure” (Gerst et al. 2018, 5) of bp. This promising perspective, which will be further developed below, can show how the process elements relate to each other and what results from them.

3. Complexity theories and borders

This section connects the discussed developments within the bordering paradigm with insights from complexity theories, providing a conceptual bridge between border research and complexity thinking. While the term in everyday language often describes pluralities or “opaque” relationships, a well-founded scientific term has actually been established. It originated in the field of technical and natural sciences and was subsequently used in the social and cultural sciences (Luhmann 1986; Nowotny 2005;

Thrift 1999; Urry 2005a). This is indicated by the “complexity turn” (Urry 2005a, 1–2) in the social sciences, which was proclaimed in the 1990s when “twenty-first-century social physics” (Urry 2005b, 235) emerged. The complexity theories do not represent a singular, coherent model, but rather different trends (Manson and O’Sullivan 2006), which, however, share certain ideas and characterize complexity thinking.

First, this includes a distinction between complexity and complicatedness. In this context, Cilliers (1998, 3) and Morin (2007, 6) differentiate between complicated systems on the one hand, which consist of multiple components and function in a regular manner, and complex systems on the other hand. These also consist of a large number of elements, but their relationships to each other – and thus also their organization and how they function – change over time and are unpredictable. Rather, complex systems behave non-linearly and “point[] to something which is just beyond our ability to understand and control” (Nowotny 2005, 15). This inherent dynamic of complex systems, which implies “unexpected outcomes” (Dittmer 2014, 390), is addressed by complexity research. This field of research makes use of the concept of emergence (Thrift 1999; Urry 2005a, 5) in order to grasp the “behavior” or the properties of the systems that emerge from the relationships of the components: “These interactions produce the ‘emergent’ properties of the system, the higher *order* properties that make the system what it is” (Cilliers 2016c, 194). Complex systems are therefore not reduced to their components, but rather – according to the well-known principle of complexity thinking – considered as a whole context that stands for more than the sum of its parts (Thrift 1999, 33).

This “more-than-summativity” is embedded in the relationships of the components, which is why relationality becomes central to complexity thinking. In complex systems, however, everything does not simply interact with everything else by chance, which is why, for Luhmann (1990, 61), complexity “describes the difference between complete and selective connectivity, specifically due to the empirical characteristics of the elements that allow for or exclude networks which are more-or-less versatile.” This means that the relationships are driven by the meanings that the components each acquire for the creation of certain system properties and thus take place selectively between the – relevant – components. In doing so, complex systems continuously adapt, as they provide relations that are both directed inward and outward, thus reacting to their environments. The self-dynamic, which is difficult to grasp, and which Luhmann (1986) calls “autopoiesis,” demonstrates that analytical categories such as causality or intentionality do not apply to complexity thinking (Turner and Baker 2019, 2). Complex systems are instead characterized by non-linear relations, through which “[t]he same ‘cause’ can [...] produce quite different kinds of effect [sic!]” (Urry 2005b, 238), which in turn resonate within the whole context and keep the system in a process of becoming. Such processes, which are described as “feedback routes” or “loops” (Cilliers 1998, 4; 2016b, 142), have a reinforcing or weakening effect and show a specific temporality: “[M]ultiple layers of the past resonate with things unfolding in the current situation, sometimes issuing something new as if from nowhere” (Dittmer 2014, 391).

Complexity research deals with systems whose properties exceed the sum of their parts. It focuses on systems that display properties variably, which stand for more than the sum of their components. This “more-than-summativity” is understood as an

emergent property that arises in the self-dynamic interplay of the system components (Cilliers 1998, 4–5). The interaction, which gives the system higher – complex – properties, stands for the relational ordering of complex systems. According to Morin (2007, 10), the interest of complexity research lies between the two levels of consideration outlined: “Complexity requires that one tries to comprehend the relations between the whole and the parts.” These can only be differentiated analytically and include, on the one hand, the system components (parts), whose interaction indicates how complex systems organize themselves. On the other hand, they encompass the system as a whole that adopts emergent properties situationally.

These basic ideas of complexity thinking are now applied to bp. The combination of complexity thinking with border studies moves away from a reductionist-functionalist border studies that examines linear and complicated bp as “supposedly complex” and towards a genuinely complexity-oriented border studies that focuses on the non-linear interplay of process elements with their emergences. Therefore, our considerations in the following are not aimed at spatial or social effects of (already-existing) borders. Here, it is about re-centering borders as composites to make their relational infrastructure and the way they function analytically accessible from a complexity perspective. For this, it is important to think of bp as complex composites in the sense of complex systems: Firstly, they may consist of different activities, discourses, bodies, artifacts, objects, etc., which distribute themselves and move in space or refer to different times, regardless of national or other territorial enclosures. Secondly, the process elements are connected in an interrelational way, so that their interplay – as a mode of continuous and unpredictable self-organization – unfolds a *borderness*. This term – already discussed by Green (2012, 579) as the outcome of a particular way of performing the border as a border – stands here for the capacity of the border that is more than the sum of its process elements. This basic link between complexity thinking and border studies, introduced earlier as “border complexities” (Wille 2024), will now be discussed in more detail through the aforementioned two levels of consideration (the parts and the whole) in complexity research.

Order of the border: The developments explained in section 2 have promoted the idea that bp consist of multiple elements that are related to each other. However, this relationship, which is discussed in border studies as the relationality of the border, has so far not been precisely determined, neither conceptually nor empirically. Complexity theories, which assume non-linear and contingent orderings to be constitutive of complex systems at the level of system components, can serve as an inspiration here. Such orderings refer to an internal *order* of complex systems, as has also been discussed above as an internal structure(ing) of bp. Understanding the internal *order* of bp as complex and approaching it through a border introspection via a “complexity lens” (Brambilla 2023) then means, firstly, asking how the elements involved relate to each other in an interrelational (reciprocal), unpredictable (non-linear) and dynamic (changing), manner. Secondly, it is necessary to consider the performative moment of *order*, which manifests as the emergence of *borderness* as a higher property, referring to a complex *gestalt of the border*.

Gestalt of the border: Complexity theories focus on systems with properties that arise from the interplay of their components. This means that the whole context – and thus the *gestalt* of a complex system – stands for more than the sum of its components. Regarding

complex bp, this means that the *borderness* – i.e. the emergent bordering capacity – must likewise be understood as a higher property. It is then neither functionally nor intentionally derived from the process elements, but unfolds performatively through the interplay of the process elements – from the interrelational, unpredictable and dynamic *order of the border*, which forms the *gestalt of the border*. This is neither a priori set nor permanently fixed, but rather is continuously revised via an ongoing complex *ordering* and can be expressed differently (e.g. to unorder, to reorder, etc.).

This complexity-oriented view on bp consists of questioning how the *order of the border* gives it a *gestalt* – and this in turn affects the *order of the border*. Thus, at this point we go further analytically than just asking which dimensions are to be distinguished in bp or to what extent the multiple elements are spatially, temporally, and materially diffused. After all, complex bp cannot – as is often (still) practiced in border studies – only be explained by the multitudes of elements considered: “Complexity is not simply a function of plentitude, but of interchange and relationships.” (Cilliers 2016c, 200). The relationships emphasized in the quote stand for the complex *order of the border*, or, more precisely: for the non-linear interplay of the process elements, which is at work according to an unpredictable logic and gives the border its *borderness*. This performative process forms the link between the *order of the border* (parts) and the *gestalt of the border* (whole) and is to be considered as a blank from a conceptual perspective. After all, this process can only be determined by taking into account the “specific conditions in a specific context at a specific time” (Cilliers 2016a, 95) and thus can only be empirically assessed. The complex *order of the border* must therefore be explored in each and every case in order to obtain insights into how bp reveal a specific *borderness*.

4. Doing complexity-oriented border research

The last section ended with the observation that complex borders must be studied empirically due to their relational specificities and the unpredictability of their emergent properties. To set the basis for such an undertaking, in this section, the complexity-oriented understanding of bp will be methodologically reformulated. This marks the starting point for a border studies that not only speaks of complexity, but takes it seriously conceptually and integrates it into research action. Based on the above, methodological principles are developed that mediate between theoretical assumptions and empirical work. These principles are designed to guide empirical research employing diverse methods.

De-reify – reveal the border as a complex order: Complexity unfolds in the non-linear interplay of the bp elements, which is why complexity-oriented border studies starts with the elements involved and their interrelationalities. While border studies have mainly been dealing with the orders created “*at, across and through borders*” (Gerst and Krämer 2021), here it is about insights *into* the border. To do so, we propose an introspective perspective as an “epistemological viewpoint” (Mezzadra and Neilson 2013, 13), which, with the help of exploratory methods, opens up access to the elements and their interrelationalities that support and ensure that bp remain cohesive. Complexity-oriented border studies brackets the idea of the border as a homogeneous, linear, or absolute fact and starts in a non-reductionist manner at the “place” from which the border becomes accessible as a complex order: in the process of creating *borderness*.

This re-centering approach (Gerst 2024) de-reifies the border and draws attention to the processes of its social and cultural production: “[D]e-reification means focussing at [sic!] the modes of production through which ‘the border’ comes into being as a concrete location and set of practices. This perspective de-totalises, de-objectifies, de-homogenises and complexifies the notion of borders” (Nieswand 2018, 595). The de-reification of the border through introspecting shifts the gaze from a singular and completed bp to the multiple and distributed elements, the interplay of which can reveal a *borderness*.

Identify – recognize relevancies in contributory border work: The introspection of bp leads to the question of how complexity can be analyzed in the interplay of the elements involved. In general, a praxeological research approach (Reckwitz 2003; Schatzki, Knorr-Cetina, and von Savigny 2001) enables us to move beyond the isolated analysis of individual elements. This approach focuses on the interplay of elements in situational accomplishments of bordering practices and is sensitive to interrelationalities and emergent *orders* (Connor 2025; Gerst and Krämer 2017). Complexity theories point out that complex systems do not emerge along linear causalities or intentional logics (Dittmer 2014, 397). This premise easily conflicts with the methodologies common in border studies, which are often still limited to human actors and assume their intentionalities. However, complexity-oriented border studies is interested in non-linear dynamics and, in addition to human “borderworkers” (Rumford 2014), also in non-human entities as elements in bp. In the dynamic interplay between human and non-human actors (elements), they perform interrelational contributory border work that is neither predictable nor follows a linear logic.

This leads to the question of which of these elements play a role in interrelational contributory border work (and which do not) – and, thus, which are (not) to be included in the analysis. Their relevance is to be determined by the *gestalt of the border*, and accordingly from the role they (do not) play for the emergence of *borderness*. There is a risk that, due to scientific, moral, or everyday cultural preconceptions, there will be premature attributions of relevancies or a selection of elements that only supposedly support bp. For this reason, a “border analytical indifference” (Gerst and Krämer 2017) is proposed for complexity-oriented border studies. This quasi-naive approach helps to develop empirically an understanding of the situational relevancies of the elements that lay the groundwork for the *gestalt of the border*. In addition, this procedure avoids analytical simplifications or inadmissible complexifications of bp.

Derive – detecting distributed contexts a-centrally: The empirical identification of the elements relevant to bp also faces the challenge that borders as complex composites are “messy” (Rumford 2014, 16). They consist of a diverse array of elements and arenas that span multiple contexts. The diffused process architecture is not accessible through singular or selective access, but through its polycontextuality – that is, through the consideration of how the elements of bp are embedded in different social, spatial, or temporal contexts simultaneously. Complexity-oriented border studies must therefore clarify where bp take place, who or what is involved, when *borderness* unfolds and over what duration these processes will be observed. In addition, it is essential to trace the interrelationalities of the polycontextually distributed elements, as they promise empirically tangible insights into complexity. Against this background, the re-centering introspection of the border paradoxically calls for an a-centric observational position. The aim of this is to get a better look at the distributed contexts of bp as well as their variable

interrelationalities. These can change continuously in a polycontextual composite – due to non-linear logics and resonant *orderings* – and thereby, for example, reinforce or weaken *borderness*.

Explore – pursuing interrelationalities: The distributed contexts can be understood as nodes in the *order of the border* and serve as starting points for investigating the border in its accomplishments – in other words, for carving out the complex composite that cannot precede the analysis. For this, it is necessary to explore the interrelationalities between the contexts or elements and thus gradually work out the polycontextual composite. What can be helpful here are, firstly, the discussed relevancies in contributory border work, which turn elements into process elements that are actually involved. Secondly, it helps to realize that relevance is only conceivable in relation to other elements: “[T]he elements of the system have no representative meaning by themselves, but only in terms of patterns of relationships with many other elements.” (Cilliers 1998, 11) Both aspects refer to the interrelational interplay of the elements, which is why complexity-oriented border studies must follow the interrelationalities in order to explore bp. In doing so, it is essential to consider the non-linear nature of such processes, which can be accommodated in research practice through an ongoing “linking and contextualizing” (Morin 2007, 18) of the process elements. In addition, their temporality must be taken into account: “Complex systems have a history. Not only do they evolve through time, but their past is co-responsible for their present behaviour.” (Cilliers 1998, 4) Complexity-oriented border studies must therefore consider not only the dynamic process of becoming, but also the state of become as an interrelational history. In such a pursuit of interrelationalities, process elements that were previously assumed to be irrelevant can, situationally, turn out to be relevant for the emergence of *borderness* – and vice versa.

This exploratory approach raises the question of how far such a pursuit of interrelationalities can or should go. According to complexity thinking, complex bp continuously react to their environments, and are thus always in the process of becoming and are never completed. Cilliers (1998, 4) discusses the problem of the “border of a complex system” as a question of framing. It should remain dynamic and commit to a careful handling of its own assumptions and the knowledge gained: “This [framework] need not be arbitrary in any way, but it does mean that the status of the framework (and the framework itself) will have to be continually revised. Our knowledge of complex systems is always provisional. We have to be modest about the claims we make about such knowledge.” (Cilliers 2016b, 143) Complexity-oriented border studies can therefore only make preliminary assumptions and exercise epistemic modesty with regard to its findings.

Leverage – epistemically mobilize precariousness: The interplay of the process elements, from which *borderness* arises, is often obscured by a supposedly linear functionality of the border. This is suggested, for example, when borders are thought of as stable lines that supposedly simply divide spaces, regulate belongings, or filter people and things. According to complexity thinking, however, the interplay is constantly in motion: it reacts to the past, to external impulses, rejects existing interrelationalities, but at the same time produces new ones through situational incompatibilities and opportunities. In order to make these highly dynamic *ordering* processes accessible, contexts in which the border does not “work smoothly” – in which contradictions, fractures, uncertainties, etc. occur – are

addressed, and so the border is identified as inherently problematic. Brambilla (2015, 29) makes a similar proposal when she describes borderscapes as “a space of negotiating actors, experiences, and representations articulated at the intersection of competing and even conflicting tensions revealing the border also as ‘a site of struggle’” thus addressing the conflicting, non-linear dynamics of bp. Complexity-oriented border studies is thus aligned with the precarious *order of the border*, understood as a praxeological *ordering* of always provisional interrelationalities, relevancies, and emergences.

Mediate – thinking circularly about order and gestalt: Complexity-oriented border studies must build an analytical bridge between the *order* and the *gestalt of the border*. The *order of the border* stands for the process elements in interrelational interplay, which in turn produces a *borderness* as the *gestalt of the border*. This performative relationship requires a procedure that takes both the elements and the whole context into account equally. Morin (2007, 10) emphasizes that “[t]he knowledge of the parts is not enough, the knowledge of the whole as a whole is not enough, if one ignores its parts” and advocates a circular research approach: “one is thus brought to make a come and go in loop to gather the knowledge of the whole and its parts.” Complexity-oriented border studies therefore addresses both “what is woven together” (Morin 2007, 6) and the resulting *borderness*. The challenge is to maintain this multiple perspective in the analysis: the border – as a whole context, i.e. a *gestalt of borderness*, and as a non-linear *ordering* of the elements involved – must remain a focal point, whereby the recursive relationship of these levels of consideration must not be overlooked. The analysis of singular process elements is always dependent on a (preliminary) understanding of the whole context, which must, however, be continuously revised as soon as new interrelations and *orderings* arise. Thus, the research process itself becomes a complex circular process: it reacts, rejects, adapts, and is prepared for contingency – just as complex bp are constantly in a state of non-linear becoming.

The principles of complexity-oriented border studies integrate complexity thinking with recent developments in border studies, recognizing the researcher as part of a recursive research process. Each principle emerges from the previous one, transforms it, and prepares the next, thereby reflecting the non-linear and self-dynamic logic of the complex *order of the border*. The process begins with *De-reify*, which dissolves fixed understandings of the border and establishes an epistemic openness from which observation becomes possible. *Identify* transfers this openness to the empirical level by discerning which elements contribute to *borderness*. *Derive* situates these elements within distributed and overlapping contexts, allowing the polycontextual nature of bp to become visible. *Explore* traces the interrelations between these contexts and elements and reveals the dynamic configurations through which *borderness* emerges. *Leverage* renders the instabilities and contradictions of these processes analytically productive and uses the precarious *order of the border* as a resource for accessing complexity. Finally, *Mediate* integrates these insights by maintaining a recursive balance between *order* and *gestalt*. The process does not end here: mediation leads back to renewed de-reification, ensuring that knowledge of complex borders remains provisional, adaptive, and open. Therefore, complexity-oriented border studies does not follow a fixed methodology, but is epistemically modest and sees itself as a reflexive process of searching and feeling one’s way along, always locating itself in the accomplishment of its objects – not where *borderness* is, but where it becomes.

5. Conclusion

The discussion above has demonstrated how rethinking complexity helps clarify the conceptual and methodological orientation in recent border studies. In light of the *Journal of Borderlands Studies*' anniversary, the aim of this paper was to reflect on developments in border research over recent decades, critically discuss the increasingly widespread discourse on complexity, and refine it in conceptual and methodological terms. We first examined how the notion of complexity is used in different fields of border studies and found that it is often invoked through the identification of multiple perspectives, dimensions, and diffusions; yet, it generally lacks conceptual grounding. Subsequently, we discussed major developments within the bordering paradigm and how they have paved the way for complexity thinking in border studies. Although these developments opened relational and dynamic perspectives on bp, they frequently remained limited to multiplicity descriptions and failed to account for the interplay of relevant process elements. Against this background, we explored the analytical potential of complexity thinking and discussed bp as complex composites characterized by relationality, non-linearity, autopoietic ordering, and emergence. The focus was placed on distinguishing between a complex *order of the border* and a complex *gestalt of the border*, a distinction that constitutes the conceptual core of this paper. This dual perspective allows borders to be understood and analyzed not merely as outcomes of intentional actions but as self-organizing composites continuously reconstituted through the performative interrelationality of their elements.

The methodological principles derived from this discussion invite scholars to move beyond linear causality and hierarchical models, emphasizing instead interrelations, feedback loops, and emergences within bp. They also call for epistemic modesty and reflexivity, recognizing that complex bp cannot be captured through single-perspective or unidirectional analysis. This reflexive modesty does not weaken the analytical claim but rather turns it into a productive epistemic stance for understanding borders as always emergent and relational phenomena. We encourage the empirical testing and refinement of these principles to further substantiate complexity-oriented border studies. This will likely raise questions about the appropriate modes of representing complex bp, whose dynamics challenge conventional linear-narrative and two-dimensional visual formats. Further unresolved questions concern the role of power in complexity-oriented border studies, particularly in response to the criticism that complexity thinking might “distract” from power relations (Amilhat Szary and Giraut 2015). Addressing this requires reflection on how power manifests as a tangible element within *the order of the border* and operates through hegemonic internal structuring. The non-linear and precarious nature of these processes provides a fruitful basis for further theoretical engagement. It is also appropriate to take greater account of the relationship between complexity and power in view of the current global trend toward fortification and the symbolic overloading of national borders. While linear, one-dimensional, and thus highly simplistic understandings of borders dominate political and public discourse, it is striking that border research is discovering the complexity of borders at precisely this time. While we began our discussion with this interesting contradiction, it is all the more important for border studies to point out the complex conditions, manifestations, and effects of supposedly simple and “clarity-generating” border

demarcations. In this sense, border scholars are invited to pursue the perspectives outlined here and to contribute to the ongoing development of complexity-oriented border studies – not as a metaphor for supposed complexity, but as a grounded and productive analytical lens for understanding borders as genuinely complex composites characterized by non-linearity, interrelationality, and emergence.

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