Border Complexities. Outlines and Perspectives of a Complexity Shift in Border Studies

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Abstract

Border studies is seeing more and more discussion about complex borders or the complexity of borders. This article systematizes this discussion and shows that there are different views circulating about what exactly is complex at borders and that the complexity term is still used imprecisely. In this article, the notion of complexity will be defined in more detail and border complexities will be proposed as a perspective for an actual complexity shift in border studies. Border complexities stands for a concept that sees borders as relational structures and focuses on the unpredictable, self-dynamic interplay of their event elements and on the emergent effects of dis/order resulting from this interplay.

Keywords: Border Studies, Bordering Turn, Complexity Shift, Border Complexities, Complexity Theory

1. Introduction

Since at least the 2010s, borders have once again been determining the political agenda in Europe and are at the center of social debate. The principle of the border to order the social world, however, is as old as humanity itself. It is based on the establishment or (de)stabilization of orders that become socially and spatially effective. This volume aims to shed more light on the principle of the border and thus on processes of negotiating orders. For this purpose, the articles discuss the latest analytical trends in border studies, in particular the most recent complexity orientation. This article aims to discuss this and, following the reception of the cultural turns, make a conceptual proposal that offers a perspective for an actual complexity shift in border studies.

Like the social sciences and cultural studies in general, border studies has also been affected by the cultural turns (Bachmann-Medick [2006] 2007), from which the changed understanding of spatial, social and colonial aspects played an important role thereafter. Thus, the insight gained in the course of the spatial turn (Soja 1989; Lefebvre [1974] 1991) that spaces stand for meaningful construction and/or relational constellations relativized the idea of borders as unquestioned, linear markings of territor-

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ial entities (Connor 2023, 28–38). From then on, the focus was on processes of space production and the borderings associated with them, which, in the course of the practice turn (Schatzki et al. 2001), were formulated as border practices with many variations (Connor 2023, 38–52). This consequential reformulation of the border follows the idea of social reality as a cultural achievement (2023, 24–28), which also includes the dis/orders caused by practices. No less significant was the postcolonial turn (Said [1978] 1995; Anzaldúa 1987; Bhabha 1994), which increased the awareness in border studies for the symbolic-cultural dimension, pushed for power-critical perspectives and allowed borders to be thought of above all as creative-productive borderlands (Fellner/Wille forthcoming). The reception of the cultural turns most important for border studies briefly outlined here has not only led to a differentiation within the multidisciplinary working field, as the strands of critical border studies, cultural border studies, cross-border studies and geopolitical border studies all show. Similarly, the cultural turns have led to various developments that manifest themselves in specific understandings and approaches to border issues. They form the basis for the complexity perspective to be developed here and will be presented in an overview.

2. Bordering Turn – Process Orientation and its Further Developments

The reception of the cultural turns is initially reflected in a fundamental reorientation in border studies, which is still effective today. It can be called the bordering turn and has been continuously evolving since the 1990s. Bordering as a "major border studies paradigm" (Scott 2017, 8) stands for overcoming the idea of the border as a given and fixed object in favor of the view that the border is both a product and a producer of social practices. In this perspective, the focus is less on fixed line-like borders and more on social processes that create borders: "This more process-based understanding of bordering shifts the focus from existential research questions (i.e., borders are this or that; borders are things that function like this or that) to studies of border's processes of emergence or becoming" (Kaiser, 2012, 522). Border studies therefore no longer focus on the border as an ontological object at the territorial edge, but on the processes of its establishment and/or (de)stabilization: on border practices (Parker et al. 2009). Early work by Henk van Houtum and colleagues, who have shaped bordering as a research concept and have worked out the relationship

between border practices (bordering), boundary demarcations (othering), order productions (ordering) and space productions (space), paved the way for this change of perspective (van Houtum/van Naerssen 2002; van Houtum et al. 2005). It can be said that, after the large cultural turns, the bordering turn assumes a socially-made nature of reality and consequently a continuous and constitutive social reproduction of the border, its change-ability, its historicity and its orderedness and how it creates dis/order (Wille 2021).

In shifting from the border to bordering, an epistemological turn has taken place in border studies, which entails a number of other—sometimes still unresolved—questions. After all, the bordering concept only provides sporadic clues as to what distinguishes border practices from non-border practices, how the borderings located in social settings are to be embedded social-theoretically or what corresponding heuristics of empirical border studies should look like. The bordering concept is primarily to be under-stood as a methodology that guides border studies and—at the intersection of the numerous disciplines involved—undergoes various practical research appropriations and implementations. These are reflected in various further developments, which indicate the need to determine bordering processes analytically in a more precise manner. Some of these developments are central to the following argumentation and are presented below.

(a) Dimensionalization of bordering processes: The investigation of bor-dering processes is usually guided by specific research interests, leading to analytical distinctions and focusing on one or more specific dimensions of such processes. For example, the spatial dimension of bordering processes, which focuses on symbolic spatial productions, relational spatial constel-lations or questions of political cooperation and spatial development, is often of interest (Wille 2012, 2015; Caesar/Evrard 2020; Ulrich/Scott 2021). Furthermore, the temporal dimension should be mentioned, which is not only limited to historical considerations in time, but also includes entangle-ments of different temporalities (Leutloff-Grandits 2021; Aubry/Schapen-donk 2023). In addition, a material dimension can be distinguished, which recently increasingly addresses the role of animals, plants and viruses under the keyword of the more-than-human perspective (Ozguc/Burridge 2023) and is interested in the materialities effective in bordering processes (Vallet 2014) as well as "objectscapes" (Kurki 2020). Related to this is the techno-logical dimension of the establishment or stabilization of borders (Pötzsch 2021), which not only views digital and automated control practices as material infrastructures, but also emphasizes the physical dimension of bor-

dering processes from a biopolitical point of view (Amoore 2006). This is followed by the multivalent dimension of bordering processes, which looks for the inequalities produced and the symbolic orders that are effective for them (Wille et al. 2023). This is by no means a complete diversification into dimensions, which often reflects a classical disciplinary division in dealing with bordering processes, but it will suffice at this point.

(b) Diffusion of bordering processes: Another important development is the tendency to increasingly think and study bordering processes in their territorial, actor-related or scalar spread and/or dispersion. This is initially represented by the observation, also referred to as the "trans-territoriality of borders" (Scott/van der Velde 2020, 145), that bordering processes diffuse in space and take place in a fragmented manner across different practices in the midst of and/or outside nation states. Accordingly, the border is increasingly regarded as a phenomenon embedded in different practices, which occurs in different places (simultaneously) and with spatial variability: "the border is no longer at the border" (Cooper/Tinning 2020, 4). Examples of this are control and regulatory practices that are not exclusively located on the territorial edge, but are spatially mobile and ubiquitously located (Balibar 2002, 84). In connection with this is also the increasingly-taken-into-account plurality of actors involved in bordering processes, which can easily be seen in the example of migration management: the territorial outsourcing of border practices implies authorities of other states; border practices in the national interior, for example, also call private (security) services into action (Risse 2018). With the insight into the plurality of actors in border practices, which is often addressed with the concepts borderwork (Rumford 2012) or boundary work (Parker 2020), the conception of bordering processes has widened once again: border practices are not considered here as 'matters' belonging to only one actor or exclusively to a state authority, but rather as diffusions of the agency of several actors, sometimes distributed on different scales. This includes civil society actors, such as non-governmental organizations, citizens, activists, artists, smugglers or refugees, who are equally (made) visible in the examination of bordering processes.

(c) Texturalization of bordering processes: A further development can be seen in the recent tendency to analytically take bordering processes seriously in their multidimensionality and diffuseness. This is referred to here as texturalization and stands for methodologies and approaches that think more comprehensively about bordering processes in the totality of the practices, dimensions, actors and forms relevant to them as well as in

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the interplay of these in space and time. For this, a relational idea of the border has prevailed, which is important for the complexity perspective to be discussed below. "'[R]elationality' as a crucial feature of the border" (Brambilla 2021, 12) goes beyond the idea of the border as a reality produced in a straightforward process that is often limited to only certain places, scales or social fields (Bürkner 2017, 91). Rather, relational thinking translates the border into a trans-territorial, trans-temporal, and trans-scalar diffused texture that consists of a multitude of scattered practices with the dimensions, actors, and forms that constitute them and that is held together by relationships between these elements: "borders demand an investigative piecing together of the many elements that explain their significance" (Scott 2020, 10). Concepts that follow a textural ontology of the border place dimensions of the border (e.g. technological, physical, multivalent), actors of the border (e.g. refugees, smugglers, border officials, activists) as well as symbolic and material forms of the border (e.g. knowledge, discourses, experiences) in a context that describes the establishment and/or (de)stabilization of borders in a relational and differentiated way. Such concepts allow, for example, the multiplicity of borders (Andersen et al. 2012; Brambilla 2015), its productions of dis/order (Sandberg 2012; Green 2012) or its contestations (Brambilla/Jones 2020) to be discussed as dynamic and powerful constellations.

The developments outlined in the course of the bordering turn have defined the bordering concept in more detail and multiplied the access points for empirical analyses. Yet many questions remain. These include, for example, the problem of social practices, which is fundamental for borderings as a border practice, but is rarely actually reflected on by border scholars. One exception is praxeological border research (Andersen et al. 2012; Côté-Boucher et al. 2014; Moffette 2015; Gerst/Krämer 2017; Auzanneau/Greco 2018; Wille/Connor 2019; Connor 2023; also Connor in this volume), which conceive of border practices following the practice turn using practice theories "to capture the changing relationships between the elements that make up the complex and dynamic system of bordering" (Iossifova 2020, 92).

3. Complexity Shift – Current Complexity Understandings and Impulses in Border Studies

Particularly in the course of the texturalization of bordering processes presented, a certain confusion of terms and concepts has arisen in border studies. Although it reflects the impressive trans-disciplinary scope of the field, it also makes the border appear to be a complicated task to investigate. Presumably against this background, and since the mid-2010s at the latest, the discussion of the border as a complex phenomenon has increasingly prevailed (Gerst et al. 2018, 3; Cooper/Tinning 2020, 2; Iossifova 2020, 92; Brambilla 2021, 12; Gerst/Krämer 2021a, 123; Gülzau et al. 2021, 17; Wille 2021; Siadou-Martin/Yildiz 2022). In this context, Laine (2022, 183) speaks of a "strong academic consensus about the inherent complexity of the border concept." Scott (2021, 27) also notes that the complexity perspective has been established in border studies: "contemporary border studies recognise [...] the complexity of border-making processes." The recent complexity fever following the bordering turn gives reason to state that there has been a complexity shift in border studies, which will be outlined in more detail here in continuation of Wille (2021). For this purpose, the aspects in bordering processes that are identified by border scholars in the current debate as complex are first discussed.

(a) Singularity of the border: Complexity-oriented argumentation is often sought when the border is looked at as a specific configuration. The border is then projected as a unique and complex structure of political, cultural, historical and other conditions, which stands for a singular expression (Cooper 2020, 20–21). The consideration of such a "strong contextual determination of borders" (Cooper/Tinning 2020, 2) or the historically unique "complex mixture of different types of power" (Nail 2021, 477) help to prevent a simplifying understanding and to understand borders adequately, precisely and in their specific context (Gerst et al. 2018, 3; Cooper/Tinning 2020, 2).

(b) Diffuseness of the border: A complexity perspective is also used for argumentation if the multitude of elements that affect bordering processes is to be considered. These include, for example, the plurality of actors of the border or the different material and symbolic forms of the border. In this context, Bürkner (2017, 90) and Laine (2017, 6) speak of a "multilevel complexity of borders" and thus, in addition to the multiple social settings —"from the geopolitical to the level of social practice and cultural production" (2017, 6)—also refer to the spatial diffusion of bordering processes.

Based on the "actor-related polyphony of the border" (Gerst et al. 2021, 17), their social and spatial diffusion and the associated multiplicity, reference is made to the polysemic (Balibar 2002, 81) or perspectival (Brambilla 2015, 22) character of the border: "Multiplicity refers not simply to diversity but points to the fact that the different way any given object or phenomenon is handled also enact specific versions of it" (Andersen/Sandberg 2012, 7). This addresses the variable and often complex constellations of actors, dimensions and forms of the border, which are (made) relevant in bordering processes—although not for everyone in the same way (Salter 2012; Wille et al. 2023).

(c) Multidimensionality of the border: Complexity is also mentioned with regard to the various dimensions according to which borders can be analytically divided (Bauder 2011; Gerst et al. 2018). The spatial dimension is often of considerable interest, which appears to have become more complex due to the previously-mentioned diffusion of the border: "One major ontological view on borders and how/where they exist [...] is the topological perspective in which borders are diffused throughout networked space as practices, discourses, technologies, etc." (Scott 2020, 9). The so-called "multi-dimensional matrix of bordering" (Konrad/Brunet-Jailly 2019, 5) is also used in different political-administrative scales and its complex interplay is sometimes discussed as (cross-border) "multi-level governance" (Hooghe/Marks 2012; Ulrich/Scott 2021). Finally, it should be noted that some of the dimensions of interest are themselves understood as complex structures: For example, Pötzsch (2021, 287), who shows for the technological dimension of bordering processes that "people and machines act hand in hand" and merge into "complex socio-technical networks." The temporal dimension of bordering processes is also described as a complex space-time structure (Donnan et al. 2017; Leutloff-Grandits 2019) or "complex temporality of borders" (Little 2015) (also Gerst in this volume).

(d) Relationality of the border: A complexity orientation is also used for argumentation with regard to the aforementioned relational character of the border. In this way, the relationships between the socially and spatially scattered actors, material and symbolic forms or between the relevant dimensions and scales of bordering processes are addressed (also Gerst and Connor in this volume). The focus on these relationships represents the concern of defining borders "as a structure of self-dynamic entanglements" (Gerst et al. 2018, 7) or "complex relational spaces" (Brambilla 2021, 12) consisting of numerous elements (Rajaram/Grundy-Warr 2007; Weier et al. 2018, 2020; Wille 2021). However, the relationality of the border has thus

far hardly been conceptually worked out. Scott (2017, 16) and Laine (2017, 14) only point to an inclusive or complementary relationship when the borderscapes approach links political visions to everyday practices or representations. Another specification is provided by Rajaram/Grundy-Warr (2007, xxvi) and Brambilla (2015, 29; 2021, 14), who classify the relationships between the elements of borderscapes as particularly tense and conflictual. Gerst et al. (2018, 3–7), in turn, emphasize the heuristic benefits of such relationships with regard to complexity. They state that the nature of the relationships is specific, influenced by a variety of factors, unpredictable and provides information about how borders work.

(e) Agonality of the border: Finally, bordering processes are often identified as complex where cultural orders have fallen into disorder or hegemonic norms are contested and alternative existences unfold: "Borders can be taken as either simplifying the world (dividing it into boxes) or making the world more complex (creating in-between spaces of encounter and hybridity)" (Schimanski/Nyman 2021, 249). This addresses interdependencies beyond binary distinctions that produce phenomena of the in-between or the hybrid. They are in competition with hegemonic orders, prove to be resistant and create complexity: "complexity by giving contradiction" (2021, 244). The agonality of the border is seen here as a crystallization point of complexifications that produce alternative orders, subjectivizations, empowerments or "alternative border futures" (Brambilla 2021, 16).

The series of aspects that border scholars classify as complex should suffice to show that complexity-oriented argumentation calls up different aspects of bordering processes and consequently different complexities of borders are identified (also Gerst in this volume). This observation should be further contextualized in a series of developments and initiatives that set significant impulses for the complexity perspective in the 2010s and can be regarded as pioneering for a complexity shift in border studies. They can be summarized under the following methodological, analytical and programmatic aspects.

(a) Strengthening methodological positions of internal border views: The thematization of complexity in border studies can initially be attributed to a stronger orientation towards internal border views. It is based on the criticism that the border can only be developed in a shortened or simplified way if methodological positions from the outside connect to existing borders—or, put simply: if bordering processes are examined around already-assumed borders and thus the actual object of analysis is missed (Brambilla 2015; Laine 2017; Bürkner 2017; Gerst et al. 2018; Weier et al. 2018, 2020;

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Gerst/Krämer 2021a, 123). Methodological positions, which are located in bordering processes or in border practices and thus *in* the border, appear to be more profitable. This methodological attitude, which puts aside the views that look at and across the border which are widespread in geopolitical border studies and cross-border studies, unifies bordering processes and the respective borders of interest and succeeds via internal border views. These are then realized via observation positions, which can be described with Gerst/Krämer (2021a, 2021b) as "in-the-border views" and "like-a-border views" and not only expose the functioning or internal structures of borders, but—in the sense of critical border studies and cultural border studies—also make effective orders visible where they otherwise remain hidden. Appropriate observation positions offer methodologies such as borderness (Green 2012), border as method (Mezzadra/Neilson 2013), migration as a prism (Hess 2018) or border praxeology (Gerst/Krämer 2017; Connor 2023; also Connor in this volume). They are based more or less explicitly on the idea of the border as a trans-territorial, trans-temporal and trans-scalarly diffused texture.

(b) Development of approaches with textural border ontology: A further impetus for the increased attention on complexity can be seen in the recent development of research which is based on a textural ontology of the border. This includes approaches that take the aforementioned methodological position *in* the border and understand borders as a relational structure consisting of different elements. For example, the ethnographic border regime analysis, which emerged in the context of critical migration research (Transit Migration Forschungsgruppe 2007; Hess et al. 2018) and attempts to view the border "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/Schmidt-Sembdner 2021, 201).

In addition, the borderscapes approach should be mentioned (also Gerst in this volume), which was developed in the course of the research project *EUBORDERSCAPES – Bordering, Political Landscapes and Social Arenas: Potentials and Challenges of Evolving Border Concepts in a post-Cold War World* (2012–2016) (Euborderscapes 2016) and was theoretically developed in particular by Chiara Brambilla (Brambilla 2015; Brambilla et al. 2015). It builds on Arjun Appadurai's "Scapes of Globalization" (1996) and defines borders as "space[s] of negotiating actors, experiences, and representations articulated at the intersection of competing and even conflicting tensions" (Brambilla 2015, 29). The concept of space used here, which is often mis-

understood by border scholars, stands for the border as a polymorphic and texture-like land*scape*, which can also be described as a relational, diffused, episodic, perspectival and contested formation of its elements (Wille forthcoming). With regard to complexity, Scott (2020, 10) underlines the potential of the approach: "[The] borderscapes approach [...] represents a highly promising tool for 're-assembling' border complexity." At the same time, borderscapes represents a space of opportunity that is intended to empower the visibility of suppressed existences to become actors in border land*scape* design (borderscaping) through committed border research (Brambilla 2021, 15).

The bordertextures approach joins the series of impulses for the complexity perspective, whose name already indicates its ontological understanding of borders. This cultural studies approach was developed by the working group of the same name of the UniGR-Center for Border Studies, which includes border scholars from Germany, France and Luxembourg. Here, the border is thought of as a dynamically changeable texture, which consists of activities, discourses, objects, bodies and knowledge, which in their complex interplay produce or challenge dis/ordering effects and thus borders (Wille et al. forthcoming). In addition to the description and analysis of everyday cultural entanglements with the border, the approach makes it possible "to reconnect and continue the numerous relationships between border discourses and aesthetic, artistic negotiations of the border" (Fellner 2020, 58). Furthermore, bordertextures exposes contradictions and simplifications, such as those found in populist discourse, and it can easily engage "in the complexity around borders" (Nossem 2020, 87). The approach is also understood as a method (bordertexturing) to uncover borderings as complex processes, to identify the effective elements therein and to bring alternative knowledge to light (Weier et al. 2018, 2020; also Fellner and Chamayou-Kuhn in this volume).

Finally, there is a proposal to conceptualize borders with the help of the assemblage concept and to make complexity empirically accessible (also Gerst in this volume). For example, Christophe Sohn (2016) with Gilles Deleuze and Félix Guattari (1987) understands the border as an assemblage, i.e. as "a heterogeneous and open-ended grouping of elements that do not form a coherent whole" (Sohn 2016, 188). This conception helps to outline the textural ontology of the border and to discuss it from a complexity perspective: The assemblage prism makes it possible to think of the relational constellations of the elements of bordering processes as continuously in the process of becoming, dynamically changeable and—at a certain

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time and/or in a certain context—as specific socio-spatial formations. In addition, the assemblage approach calls the links and edges of the structure into question, i.e. how certain elements join the texture-like formation or also enter into alliances with other assemblages. Assemblage thinking also addresses the emergent properties of textural borders, which cannot be identified from their constitutive elements, but—following the complexity thinking—emerge from their interplay.

(c) Study of borders through the complexity lens: Further impulses for the complexity perspective came from various initiatives of border studies that deal programmatically with borders related to complexity. These include the conference *Complex Borders: Dimensions – Dynamics – Technologies* (November 3–4, 2016), which was organized by the Center B/ORDERS IN MOTION of the European University Viadrina Frankfurt (Oder). Following this conference, the special issue *Complex Borders. Perspectives of Current Border Studies* (Gerst et al. 2018), was published, which attempted to view "borderings not as a simplified and simplifying relationship, but as a product and producer of a complex mixture" (2018, 3). In addition, the *Border Complexities Project* (2019–2022) initiated by the UniGR-Center for Border Studies should be mentioned, in which border scholars from Germany, France and Luxembourg set themselves the goal in an interdisciplinary workshop series to "understand border (space) phenomena in their complexity and relationality" (Border Complexities 2019). This book is the first of two volumes in which the project results are put up for discussion.

The polysemy of complexity described above as well as the still isolated methodological-analytical developments and initiatives are due on the one hand to the multidisciplinary nature of border studies, through which certain research interests and research agendas are not strategically related to each other. On the other hand, insufficiently reflected ideas of bordering processes often compete in this working field, each of which follows the further developments of the bordering turn in different ways or not consistently. In addition, within the academic debate, there sometimes seems to be an everyday understanding of complexity, which prematurely equates the term with complicatedness, confusion and indeterminacy. Edgar Morin (2007, 6) also points out this general tendency or danger: "[C]omplexity […] usually means confusion and uncertainty; the expression 'it is complex' in fact expresses the difficulty of giving a definition or explanation." The plurality of complexity identified and the still imprecise use of the term insinuated here by the author—which often only states that "borders are a complicated social phenomenon" (Kolossov 2005, 606)—are by no means

intended to degrade the current debate. Rather, they should be the reason for a departure in border studies, which Laine (2021, 7–8) has recently called for: "The evident complexity of borders cannot be the end point of Border Studies but should instead be considered as a starting point, as a challenge that needs to be systematically tackled." For such a departure, which turns to the complexity of borders or rather border complexities, it is first of all necessary to overcome the everyday understanding of complexity. Thus, the following principles of complexity thinking are explained and associated with bordering processes.

4. Border Complexities – Complexity Theories and Borderings as Emergences

In order to clarify what complexity is, complexity theorists (Cilliers 1998, 3; Morin 2007, 6) often first draw attention to the fact that complexity is not to be confused with complicatedness: "Complexity though is not the same as simply complicated" (Urry 2005a, 3). They distinguish between complicated structures[1] on the one hand, which consist of a multitude of elements and function in a regular manner, and complex structures, on the other hand. Although the latter also consist of a large number of elements, its functioning changes over time and is unpredictable (Cilliers 1998, 3; Nowotny 2005, 15; Urry 2005a, 3). They 'intrinsically' bring forth orders or patterns that are volatile and elusive: "Complexity points to something which is just beyond our ability to understand and control, yet we presume it is densely packed, ordered and structured in some way that we fail to comprehend as yet" (Nowotny 2005, 15). Such self-dynamic structures are brought into focus with complexity research in order to study their contingent functions, features and effects.

This research interest developed in the 1980s as a result of the increased computing power and the chaos theory of the 1970s in order to grasp emergent phenomena which, up until this point, were elusive or hardly tangible with the proven paradigmatic calculations and linear modeling (2015, 16).

> [T]he chief impulse behind complexity theory is an anti-reductionist one, representing a shift towards understanding the properties of interaction of systems as more than the sum of their parts. This is, then, the

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1 In complexity theories, the term "systems" is often used instead of "structures".

idea of a science of holistic emergent order; a science of qualities as much as of quantities, a science of 'the potential for emergent order in complex and unpredictable phenomena' (Goodwin, 1997: 112), a more open science which asserts 'the primacy of processes over events, of relationships over entities and of development over structure' (Ingold, 1990: 209). (Thrift 1999, 33)

Complexity theories, which privilege processes, relationships and emergences, were initially established in the technical and natural sciences and have subsequently found their way into the social sciences and cultural studies (Thrift 1999, 33; Nowotny 2005; Urry 2005a; Filipovic 2015; also Cyrus in this volume). In this context, reference should be made not only to Niklas Luhman (1984), who dealt with the reduction of complexity in societies, but above all to the generally increased interest in patterns and dynamics of social dis/orders, which were also discussed as social physics with the advent of big data and the use of mathematical methods. In the social sciences, a "complexity turn" (Urry 2005a, 1–2) was accordingly proclaimed when, in the 1990s, under the influence of the globalization debate, so-called "21st-century social physics" (Urry 2005b, 235) were increasingly discussed, including the works of Giddens, Harvey, Baumann, Castells and others. In this context, no singular theory of complexity has prevailed as a master reference; rather, multidisciplinary complexity research has differentiated itself into different strands (also Cyrus in this volume): Manson/O'Sullivan (2006, 678) distinguish between an "algorithmic complexity" that reconstructs the characteristics of complex structures with the help of mathematical complexity and informational theories. Furthermore, they speak of a "deterministic complexity" that combines dynamic structures with chaos theory and catastrophe theory and finally of an "aggregate complexity." This deals with the question of how different elements form a structure that brings forth certain orders and has the ability to learn. Paul Cilliers (2016, 141) also systematizes and distinguishes between a strictly mathematical and computational trend inspired by chaos theory and a more critical trend of complexity theories. The latter is about understanding why and how social problems are complex.

In view of these and other systematizations, complexity research is to be understood as a multi-paradigmatic field that turns to material and/or social structures with an own form of agency. Such structures of performative character are the subjects of analyses that seek to understand "how there is always order and disorder within physical and social phenomena"

(Urry 2005b, 238). The complexity of the structures considered cannot be seen as an ontological property. Rather, the emergent orders or patterns that arise via the contingent interplay of the event elements are what stand for complexity: "The complexity emerges as a result of the patterns of interaction between the elements" (Cilliers 1998, 4–5). Regarding the border, this means asking by means of which unpredictable logics which dis/orders emerge, become socially and spatially effective from the interplay of the numerous elements of bordering processes. The intersection of complexity thinking with the bordering concept—following its texturalization—leads to what is proposed here as border complexities: Border complexities are meant to stand for a concept inspired by complexity theories, which sees borders as relational structures and focuses on the unpredictable, self-dynamic interplay of their event elements and on their emergent effects of dis/order resulting from this interplay. Thus, border complexities build on the bordering turn and its further developments, take a methodological internal border view and analytically go further than just asking which dimensions play a role in bordering processes or can be distinguished analytically or to what extent the elements involved are territorial, actor-related and scalarly diffused. Bordering processes, which are assumed to be complex, cannot—as is often (still) practiced in current border studies—only be explained by the multitude of elements considered: "Complexity is not simply a function of plentitude, but of interchange and relationships" (Cilliers 2016b, 200). Rather, border complexities address the emergent moment, which manifests where the texture of the elements relevant in bordering processes is merely a prerequisite for making their reciprocal-dynamic relationships visible—as an interplay that is effective for emerging dis/orders. Border complexities thus follows the meaning of *complexus* (lat.) in a twofold manner: On the one hand, the concept addresses "what is woven together" (Morin 2007, 6), and, on the other hand, it addresses the reciprocal relationships of the event elements and the resulting establishments or (de)stabilizations of borders. The challenge for border scholars is to keep an eye on the border "as a whole," i.e. as a textural structure, as well as the elements that make up it, while also focusing on the difficult-to-grasp relationship between these two levels in which emergences unfold. In this context, Morin (2007, 10) proposes a dynamic strategy of complexity-oriented research that should attempt to recursively "encircle" this relationship:

> Complexity requires that one tries to comprehend the relations between the whole and the parts. The knowledge of the parts is not enough, the knowledge of the whole as a whole is not enough, if one ignores its parts; one is thus brought to make a come and go in loop to gather the knowledge of the whole and its parts.

Border complexities as a concept that can open up a perspective for an actual complexity shift in border studies, thus focuses on the dynamic relationality of texturally composed borders and on the resulting emergences that become effective as borderings. In addition to a number of practical research and methodological questions that are discussed in this volume by Norbert Cyrus, Dominik Gerst and Ulla Connor, border complexities are ultimately to be discussed as an empirically accessible structure—or, more precisely: the event elements and their relationships constitutive of border complexities and therefore to be taken into account in analyses should be reflected upon (also Gerst and Connor in this volume). After all, according to complexity theories, complex structures are not composed of a random assembly of elements, but of elements that are important for the characteristics and effects of the structure. This meaning, however, is not inscribed in the elements, as Cilliers (1998, 11) explains, but rather arises in contingent interplay with 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." Border complexities cannot therefore be determined in advance of the analysis; rather, they must be carved out as a complex texture via exploratory procedures, in which supposedly insignificant elements can turn out to be quite significant—or vice versa. These explorations—which stand for the process of texturing (Wille 2021, 115) and can be guided by praxeological thinking (Connor in this volume)—are to be understood as tactile and acentric searching movements for relevant event elements for the establishment or (de)stabilization of borders and are oriented towards the "order of the border itself" (Gerst/Krämer 2021a, 131)—i.e. they follow those reciprocal relations that constitute border complexities. Such references or links are expressed in empirical observation, for example in performative "connection and relation logics" (2021a, 131) of practices, discourses, knowledge, activities, bodies and objects and indicate to what extent they are (not) significant and thus are (not) affiliated with border complexities. However, the constitutive meaning is not derived from random relationships, but should be characterized by a relevance to be determined empirically, which

the linked elements acquire in their interplay for emergent establishments or (de)stabilizations of borders—or, in other words: the relationships to be identified should be characterized by a borderness. As borderness reference, Sarah Green's work (2012, 580) can be used to qualify those relations of border complexities that make individual elements into actual event elements in "the way borders are [...] generated by [...] the classification system that distinguishes (or fails to distinguish) people, places and things in one way rather than another."

The considerations on the (re-)construction and investigation of border complexities are intended to provide initial indications of how borderings can be empirically approached as emergences. What is left neglected in this are the dynamics of complex structures, which can be held subject to their continuously becoming nature and thus changeability as well as temporality (Cilliers 1998, 3–4; 2016c, 89, 92; Greve/Schnabel 2011, 7), and, on the other hand, to any qualities of the borderness relationships (non-linearity, density, range, recursivity) (Cilliers 1998, 3–4; Urry 2005b, 238; Cyrus in this volume). In addition, the question of the border of border complexities, i.e. the endpoints of the tactile and acentric searching movement along relations that are relevant for borderings and constitute border complexities, should be discussed further (Gerst and Connor in this volume). Cillier (1998, 4) treats the problem of the "border of a complex system"—which is not isolated, but is rather in relation to environments—as a problem of framing, which should remain flexible and commit to a careful handling of the knowledge gained: "This [certain framework] need not be arbitrary in any way, but it does mean that the status of the framework will have continually revised. Our knowledge of complex systems is always provisional. We have to be modest about the claims we make about such knowledge" (Cilliers 2016a, 143).

5. Complexity Attitude – Epistemological Complexity as an Outlook

This article has systematized the complexity discussion that has emerged in border studies since the mid-2010s and has created a perspective for an actual complexity shift. The starting point of the considerations was the reception of the cultural turns, which led to an epistemological turn in border studies. The established process orientation around the turn of the millennium, which strengthened the concept of border practices, was outlined with its further developments as a bordering turn. In addition

to the dimensionalization and diffusion of bordering processes, these also include their texturalization, which has paved the way for a complexity perspective. The article first discussed what border scholars qualify as complex in the current academic debate and which methodological-analytical developments and programmatic initiatives have promoted the increased complexity orientation. The approaches show that the debate is characterized by different ideas of complexity and a plurality of what is perceived as complex at borders. In addition, the article identified an imprecise use of the complexity term, with which often only a complicatedness of borders is stated. Against this background, the concept of complexity was then defined with the help of complexity theories and border complexities were proposed as a perspective for an actual complexity shift in border studies. Border complexities stands for a concept inspired by complexity theories that sees borders as relational structures and focuses on the unpredictable, self-dynamic interplay of their event elements and on the emergent effects of dis/order resulting from this interplay.

With this conceptual proposal, the attempt was made to address the latest developments in border studies leading towards a complexity shift and to productively relate them to complexity thinking. Border complexities and their characteristics of texturality, relationality, dynamics and emergence were used to highlight those analytical aspects that can be connected to the bordering turn and that are still little or not taken into account in existing concepts of border research. This desideratum can be explained, on the one hand, by the still-young complexity fever and the still-insufficient cross-disciplinary debate within border studies. On the other hand, the aspiration of complexity-oriented research not only to identify the elements of bordering processes and to treat them in isolation from one another, but also to understand them empirically in their dynamic interplay as a texture with emergent effects, seems to be particularly challenging in empirical research.

In addition, this article's aim with border complexities was neither to update nor fix the statement often made by border scholars that borders are complex. Therefore, the talk of complex borders was avoided in favor of border complexities to indicate that borders do not stand for ontologically complex objects of investigation and that analyses which neglect the emergent moment and focus on individual 'simple' elements of textural borders are quite legitimate. The complexity view represents only a specific perspective of bordering processes, which, however, does seem to promise a more differentiated understanding than other approaches to border issues.

For this reason, the epistemological complexity—which manifests itself in a complexity-sensitive way to approach social reality (Cyrus in this volume)—is strengthened in a twofold sense as an outlook: on the one hand, as a methodological perspective that can follow the border along its relationships, which is sufficiently open to the unexpected and knows how to capture the unpredictable emergent moment—in short: a "complexity attitude" (Preiser/Woermann 2016, 1), which is prepared for complexity and its effects and knows how to detect them (also Gerst and Connor in this volume). On the other hand, epistemological complexity is intended to give a programmatic perspective to a new departure in border studies, which was most recently demanded by Walther et al. (2023). This perspective assumes an understanding of complexity, which can be the basis for an actual complexity shift and allows for analyses beyond complexity.

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