

**Organizational Coordination of Digital Structures:
The Effects of ICT and Values on Grand Challenges**

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Abstract

This doctoral thesis sheds light on organizing contributions toward grand challenges by highlighting various effects on organizing values, coordination mechanisms, and digital technologies. Grand challenges are defined as vast and complex problems affecting organizations, governments, and entire societies. The objective of this thesis is to address such global societal problems. Towards this end, at first a systematic literature review depicts the overall process of addressing grand challenges. Second, building upon the holistic process from this literature review, an empirical inquiry is conducted, scrutinizing the development of organizing mechanisms and structures along organizing values. Third, digital technologies and their role in the solution process are explored. Taken as a whole, the systematic literature review offers a holistic overview over the solution process of grand challenges addressed by organizations, while the empirically substantiated theoretical frameworks analyze and highlight coordination mechanisms, organizing structures and values, as well as digital infrastructures in great detail.

Table of Contents

Overview of the three Dissertation Papers	IV
Synopsis.....	1
Introduction.....	1
Theoretical Framework.....	2
Research Setting.....	6
Methods.....	8
Summary of the three Essays	14
Areas of Synergy and Contribution	20
Future Research	25
References.....	29
Figures.....	34
Tables.....	36
First Dissertation Paper	42
Second Dissertation Paper	67
Third Dissertation Paper.....	117
Curriculum Vitae.....	170
Publications	171
Statutory Declaration	172
Self-Declaration.....	173
Appendix.....	(confidential)

Overview of the three Dissertation Papers

First Dissertation Paper

Addressing grand challenges through different forms of organizing: A literature review

(Leo Juri Kaufmann and Anja Danner-Schröder)

Second Dissertation Paper

Collective action as actio et reactio: Aligning organizing structures with organizational values

(Leo Juri Kaufmann and Anja Danner-Schröder)

Third Dissertation Paper

Digital orbit of collective action: Switching between inclusive and exclusive modes of ICT in FridaysForFuture

(Leo Juri Kaufmann)

Synopsis

Introduction

In my dissertation, I shed light on the discussion around organizing structures and their contributions toward grand challenges, vast intertwined and global problems, by highlighting various effects on organizing values, coordination mechanisms, and digital technologies. Defining processes that address such societal problems, various organizational forms came to the fore, each distinctively depending on digital technologies, coordination, and organizing values. Of particular interest were social movements which appear as initiators for societal and structural change, depicting a first step toward tackling grand challenges. For a long time, collectives were seen as irrational (Tarde, 1968) and often created deep discomfort toward any form of organizing (Clemens, 2005). However, discussions about organizing structures in collective action have changed tremendously, revealing such organizing mechanisms as anchoring from the environment and developing organizing infrastructures and values (Perkmann & Spicer, 2014; Reinecke, 2018). Based on this conceptualization, the discussion in the collective-action literature centers around the question of how exactly collective forms of action organize and what role digital technologies and organizing values play.

Inspired by this research interest, the overarching research question of the three dissertation essays scrutinizes organizing forms tackling grand challenges. The discussion, I outline at length, reveals that addressing grand challenges comprises (1) forms of collective action, which (2) embody organizational characteristics, in a (3) unique and paradoxical digital manner.

The structure of this synopsis is as follows. I begin with the theoretical framework that prompts the research question. Further, I outline my research setting and the methods I applied for the data analysis. Last, I summarize the three papers and ultimately highlight the areas of synergy, as well as future research avenues.

Theoretical Framework

Grand challenges are formulations of large-scale problems addressed through collaborative efforts (George, Howard-Grenville, Joshi, & Tihanyi, 2016). They continuously challenge organizational research agendas, multilateral agencies, foundations, and governments, due to their highly intertwined, complex, and global characteristics (George et al., 2016; Kornberger, Leixnering, Meyer, & Höllerer, 2018). Grand challenges that institutions and organizations address are most famously described in the United Nations' 17 sustainable development goals to "end poverty, protect the planet, and ensure prosperity for all as part of their new global 'Agenda 2030'" (Howard-Grenville, Davis, Dyllick, Joshi, Miller, Thau, & Tsui, 2017, p. 107). Much research reveals organizational and institutional contributions to tackling such grand challenges. However, discussions arose regarding the role of social movements or collectives in the solution process. Traditional research on social movements postulates a deep discomfort or an aversion toward any form of organizing (Clemens, 2005), with social movement actors considered irrational (Tarde, 1968), deviant, and potentially destructive (Weber & King, 2014), and social movements being neither expected nor able to contribute toward a common goal (Puranam, Alexy, & Reitzig, 2014). In sum, established organizations with stable structures and the necessary capacities and expertise address most complex problems (Anders, 2018; Weidenkaff, 2018). Emergent forms of collectives lack organizational characteristics, necessary skills, and experience (Majchrzak, Jarvenpaa, & Hollingshead, 2007; Danner-Schröder & Müller-Seitz, 2020), and they depict a disruptive "alternative culture" (Kumar & Chamola, 2019, p. 79), leading to the breakdown of social order (Weber & King, 2014).

Collective-action scholars, grand-challenge research, and recent social movement studies have substantially challenged this view. Collectives are an important instance in the solution process of grand challenges, depicting the first step in identifying and sending an impulse toward organizational awareness and change (Kaufmann & Danner-Schröder, 2022; Wright & Nyberg,

2017). Either established organizations and institutions pick up this identification or impulse, or forms of collective action process and develop it. In doing so, collectives reveal organizing characteristics, such as anchoring forms from the direct environment (Perkmann & Spicer, 2014), developing and aligning organizing structures and principles with values (Reinecke, 2018), and establishing a far-reaching digital infrastructure (Massa & O'Mahony, 2021). In contrast to the initial view on collective action, collectives are no longer a structureless form of social disorder, disrupting the solution process of grand challenges; they are a critical first step in identifying and signaling such problems. They bear the potential to develop organizing characteristics to further contribute to the solution process, with which established organizations, states, and governments have struggled and which they have failed to solve for over 60 years. Such organizing characteristics are by no means intuitive and, thus, demand closer thorough analysis.

Following this line of thought, social movement theory and organizational studies gravitated toward each other. The necessity of adding social movement theory into organizational studies lies in the translation of shared interests into collective action. Viewing social movements from an organizational perspective lies in the ability to directly or indirectly control changes in the environment (Weber & King, 2014). Thus, applying an organizational lens to viewing social movements reveals a certain life cycle, starting with almost no organization (Leach, 2005) and resulting in either a rather informal, decentralized, non-hierarchical form (Reinecke, 2018; Leach, 2013; Polletta, 2002) or a more formal, non-democratic, bureaucratic (sometimes oligarchic) organizing structure (Rucht, 1999), striving to solve complex problems.

This approximation of social movement theory and organizational studies has substantially challenged the mere disruptive, unexpected, non-contributing view on collectives and shifted our focus away from purely established organizational contributions and toward organizing characteristics in social movements (Reinecke, 2018; Perkmann & Spicer, 2014; Leach, 2013;

Polletta, 2002; Weber & King, 2014; Kaufmann & Danner-Schröder, 2022; Wright & Nyberg, 2017). McCarthy and Zald (1977) initially broke this stigma of a structureless form with the example of the social movement “justice for black Americans,” which they characterize as a “complex, or formal, organization” (p. 1218). This was the first “organizations-focused perspective of social movements” (de Bakker, den Hond, King, & Weber, 2013, p. 576). Polletta (2002) shows that social movements may also develop decentralized, non-hierarchical organizing forms whose enactment occurs in contrast to bureaucracy. Reinecke (2018) reveals that social movements also organize according to some form of organizational value, a “taken-for-granted, value-infused core of the organization” (Perkmann & Spicer, 2014, p. 1787). Much research compares the development of social movements’ digital infrastructure to that of established traditional organizations. Bruns, Highfield, and Burgess (2013) depict the utilization of targeted social media activity during the Arab Spring. Social movements and traditional organizations utilize social media as organizing tools for mobilization purposes, developing a digital mean of organizing and coordinating (Pavan, 2017; van Laer & van Aelst, 2013; Loader, 2008; Fahmy & Ibrahim, 2021). These studies analyzed the organizational characteristics of social movements.

Taken together, the conceptualization of organizing characteristics in social movements has radically shifted our understanding of their contribution toward grand challenges. Although outcomes may be idiosyncratic, social movements arguably lay the first brick for societal and organizational change (Wright & Nyberg, 2017). Whereas in the traditional view forms of collective action are disruptive and irrational throughout the solution process, the incorporation of social movements into the solution process as well as the recognition of their organizing merits allow a better grip on addressing grand challenges. Moreover, the organizing aspects of social movements in the problem-solution process of facing grand challenges deserve more elaboration because their characteristics are by no means trivial.

First, social movements, too, develop structures that may become bureaucracies and hierarchies on the one hand (McCarthy & Zald, 1977; de Bakker, den Hond, & Laamanen, 2017) or, on the other, decentralized heterarchies (Polletta, 2002). This structural development needs closer elaboration, for processes remain unresolved in how vast social movements develop any organizational structure (de Bakker et al., 2017), as well as organizing values or organizing principles (Reinecke, 2018; Leach, 2013; Polletta, 2002). Interestingly, these values may directly oppose organizing forms of collective action, forcing them to change and get in line (Perkmann & Spicer, 2014). This alignment leaves the question of how exactly enactment and reconfiguration of organizing structures occur to fit organizing values. Finally, much research has revealed the organizational utilization of digital technologies within forms of organizing (Garrett, Bimber, de Zúñiga, Heinderyckx, Kelly, & Smith, 2012; Bruns et al., 2013). Not surprisingly, descriptions of such utilization characterize it as rather open, easily accessible, and collective (van Laer & van Aelst, 2013; van Aelst & Walgrave, 2002; Bennett, 2003), as one would expect from digital interaction. However, recent research reveals rather counterintuitive paradoxical characteristics (Dobusch, Dobusch, & Müller-Seitz, 2019; Massa & O'Mahony, 2021; Kozica, Gebhardt, Müller-Seitz, & Kaiser, 2015), showing that such expected open qualities require a less intuitive “closed quality” in the digital coordination (Dobusch et al., 2019, p. 364). Thus, digital-coordination openness occurs through complementary closeness, raising the question of how digitally based social movements coordinate and organize and what role such paradoxes play.

Summing up, the guiding questions for my dissertation project are: (1) Which organizing forms exist to tackle most complex grand challenges? (2) How do initiators of the solution process, i.e., social movements, emerge, develop structures, and align them with organizing values? (3) How do social movements organize and coordinate in a digital context?

Research Setting

Studying these research questions demands “triangulation measures to ground the emergent theory” (Eisenhardt, 1989, p. 536). Of particular interest are organizing forms that tackle most complex, intertwined, and global problems (George et al., 2016; Howard-Grenville et al., 2017). To address these research questions, I entered the field with a broad and open approach, focusing on vast social movements that target the most complex and intertwined grand challenges. Arguably, one of the most complex and wicked grand challenges is climate action, one of 17 defined UN sustainable development goal areas (George et al., 2016). Social movements, institutions, and governments have tackled climate change since the 1950s (Ansari, Wijen, & Gray, 2013), but the prospect of a sustainable solution has remained a utopian idea. Wright, Nyberg, and Grant (2012) stated that “climate change has rapidly emerged as the major social, political and economic challenge of this century” (p. 1451), where “we are unlikely to see the emergence of a broader social movement agitating for the fundamental social and economic changes required” (p. 1472).

Yet, I decided to choose the largest social movement in recent times, addressing climate action as my object of study, through FridaysForFuture (FFF). FFF is a form of collective action that 15-year-old Greta Thunberg initiated in December 2018. Protesting alone in front of the Swedish Parliament, she has since mobilized over 14,000,000 demonstrators worldwide (FridaysForFuture, 2021). The first global strike alone, on 15 March 2019, mobilized 300,000 people in more than 220 places across Germany and 1,789,235 people worldwide (ipb, 2019). Germany has crystalized as a particularly important pathfinder, accounting for the maximum number of FFF-related events in Europe and the second most worldwide (FridaysForFuture, 2021). Table 1 provides an overview.

I had the opportunity to cooperate with local groups across Germany. Based on my sampling logic, I expected to witness heavier structural influence from larger German cities with dense populations than from smaller cities. Further, I expected to see more drastic changes in pioneering local groups than subsequent groups. The rationale behind this sampling logic was grasping emergent processes from pioneering local groups or cities, which forego heavy organizing changes in order to adapt to the circumstances, because no prior knowledge, group memberships, tasks, and roles were available (Majchrzak et al., 2007; Danner-Schröder & Müller-Seitz, 2020). In turn, such pioneers may offer guidelines for potential subsequent local groups, providing some kind of experience and expertise. Thus, I assumed more emergent structural processes in pioneering northern local groups, and establishing processes in larger local groups. Figure 2 provides an overview of the sampling logic for data triangulation. The categories of the sampling logic follow below.

1) Earliest interactions amongst FFF students began in December 2018 in Bad Segeberg, almost immediately after the movement gained momentum in Sweden. At that time, no memberships had formed and students mostly got together via word of mouth, especially via social media. Rudimentarily, the group chose public speakers on a voluntary and spontaneous basis, due to the absence of official roles and responsibilities. The subsequent events in Kiel received large media attention. I did not have the opportunity to participate in these early emergent mobilizations, for I chose this research topic one year later, in late 2019, after the movement had already gained huge momentum in Germany. However, I have accompanied these early local groups since, and they have provided protocols and chat logs from these emergent times. Tables 2 – 8 provide an overview.

2) After the initial contributions of FFF pioneers, the movement spread through the whole German landscape. Especially large German cities such as Berlin and Köln heavily contributed to the establishment of a centralized coordination. Larger groups have concentrated their

resources on creating digital infrastructures, nationwide roles, responsibilities, rules, and norms as well as basic democratic processes, similar to the German parliament. The consensus was reached that the larger the local group the more representatives the group could send to national committees. Thus, larger cities can send up to five representatives to the nationwide office. FFF refers to such representatives as delegates. Hence, large cities send up to five delegates, smaller cities approximately one or two. Delegates can change national structures and modify norms and rules through proper legitimation processes. Larger cities have the capacity to contribute more directly to nationwide structures than smaller cities can. I had many opportunities to witness electoral votes concerning spokespersons and delegates (from the national level) and structural changes, which official FFF papers document. During my three years of research, ten published legislative papers documented many structural changes, each one accompanied by discussions, proposals, and votes I inspected. Table 1 in the second paper provides an overview.

3) Surprisingly, various local groups embodied unparalleled challenges and particularities I could not allocate in either classification, such as hostile attacks, adjustments according to the COVID pandemic, and early terminations. This last category, unique particularities, forms the third category of the sampling logic namely Dresden, Gelsenkirchen, and Freiburg.

Methods

Before starting my case study, we conducted and finalized an in-depth literature review of organizing forms addressing grand challenges (see Kaufmann & Danner-Schröder, 2022). From there, I developed my research questions and sampled my case, as expounded above.

Data collection: I entered the field with the broad goal of studying diverse field participants on physical and virtual means within the FFF Germany framework. While sampling and gathering

information from German FFF groups, I noticed that some groups had distinct and unique characteristics, resulting in the classification into three categories:

First, smaller northern cities functioned as pioneers of the movement. Second, usually larger German cities had a stronger impact on nationwide structures. Both conformed with my sampling rationale. Third, various cities and local groups had unparalleled challenges and peculiarities worth investigating.

To answer my research questions, I chose to study a small number of cases in depth, to open up a broad range of insights on the one hand, while allowing a deeper understanding of such cases on the other (for a similar approach, see Grodal & O'Mahony, 2017; Lawrence & Dover, 2015). The small number of cases reflects the three categories.

First, owing to its proximity to the founder's home country in Sweden, northern German cities functioned as pioneers. We studied local groups in Bad Segeberg, Kiel, and Greifswald, to capture the emergence of FFF in Germany (Aldrich & Fiol, 1994; Dacin, 1997; Perkmann & Spicer, 2014). Second, owing to the larger population and therefore increased participation, big German cities contributed strongly to the establishment of a centralized organizing structure (McCarthy & Zald, 1977; Clemens, 2005), even leading to bureaucratic processes (de Bakker et al., 2017). We scrutinized local groups in Berlin, Dortmund, Köln, and München, to capture the structural building of the movement. Finally, some cities or local groups exhibited particularities and unparallel challenges such as attacks by hostiles or early cancelations (Garrett, 2006). Thus, local groups in Dresden, Gelsenkirchen, and Freiburg complemented our objects of interest.

In every category, I personally visited at least one city, to foster relations with FFF members and to build trust (Kirk & Miller, 1986). I participated as an embedded temporal observer in the field for two years, taking part in council meetings, digital meetings, demonstrations, and

especially plenary sessions in accordance with COVID-19 measures and restrictions. Table 1 in the first paper provides an overview. These impressions helped explain the experience of FFF members in their organizing endeavor (Gioia, Corley, & Hamilton, 2013; Langley, 1999; Miettinen, Samra-Fredericks, & Yanow, 2009). My data collection involved extensive field notes, as well as semi-structured formal and informal interviews. I requested and received further access to group-specific protocols and structural data, from which the public is usually restricted. Such additional and more detailed data complemented my archival data, consisting of news articles, reports, documents, guidelines, blogs, and legislative papers. Table 8 provides an overview.

Another important tool of data collection was netnography, the “new social media research” (Kozinets, 2015, p. 3). Utilizing netnography I gathered public data from various social media outlets and chat logs. FFF offers a unique opportunity for empirical analysis incorporating netnography because much communication, especially from a nationwide perspective, takes place virtually (for similar reasoning, see Kozica, et al., 2015). Netnography enabled me to gather thousands of pages of data on the one hand, while establishing new contacts through social media outlets on the other. As my personal contribution to social media has increased throughout the years, so did the reach and followership of my social media accounts and thus the willingness of FFF members to collaborate. As I signaled usefulness via sharing FFF-related content to thousands of followers, I was attracting attention to high-social-media profiles, whose owners, in turn, provided me with important contacts. Table 2 in the second paper provides an overview of all netnographic data.

Data analysis: Due to the highly dynamic nature of the netroots movement, a movement organized through online media, and the vast amount of information produced through virtual means, I analyzed the data by combining offline and online methods to shed light on every aspect from different angles. Social movements and their development via the Internet are

“hard to quantify” (van Aelst & Walgrave, 2002, p. 487), demanding continuous focus to grasp the “moving target” (van de Donk, Loader, Nixon, & Rucht, 2004, p. 2). Multiple data-analysis methods were necessary to increase data validity and stay in touch with FFF’s way of comprehending, acting, and thinking (Kirk & Miller, 1986; Gioia et al., 2013). Tables 2 – 6 provide an overview of social media analysis.

Coding: I coded all data solely using the qualitative data analysis software MAXQDA. For that purpose, I coded all related information with in vivo codes using the language of FFF members (Miettinen et al., 2009). In-vivo codes in the MAXQDA software helped to structure the vast dataset (Glaser & Strauss, 1967). Of particular interest were aspects relating to structural, organizing, and information and communication technology (ICT). Tables 4 – 6 in the second paper and Tables 1 – 4 in the third paper provide an overview of the coding schemes.

Creating a timeline: I displayed all important organizing actions and critical caesuras and milestones on a timeline. Timelines help by presenting and visualizing information chronologically, to provide a more comprehensible overview (Langley, 1999). This chronological overview allowed a better understanding of events that happened before I entered the field, and I complemented them with my own observations. Thus, I could detect parallels as well as dissimilarities. Figure 1 in the second paper displays the timeline.

Thematic analysis: To make sense of themes or patterns of meaning within my data, I used thematic analysis, which categorizes the content of text and identifies relationships (Lane, Koka, & Pathak, 2002; Fay, 2011). Thus, patterns are related to a literature-based analysis of organizing structures for numerous forms of collectives (Fay, 2011). The inductive process (Miles & Huberman, 1994) of thematic analysis, with coding preceding theme development and themes built from codes, allowed a highly flexible research design. I iteratively repeated new data from netnography, such as updates from chat logs and comments, integrating them

with interviews, observations, and archival data (for a similar approach, see Grodal & O'Mahony, 2017). This flexible approach narrowed and shifted the focus throughout my years of data collection. Figure 2 shows the triangulation procedure.

Member check: Finally, I discussed findings with high-ranking and experienced FFF-members. I visited many settings retrospectively, to gather the most current observations and ask current members for feedback. Due to the fast-paced nature of FFF, the cadres of most local groups have changed drastically within a single year, let alone within my data collection and analysis time span of three years. Thus, in my final visits to local settings, very few former members from the beginning of my analysis were still participating in FFF operations. Most former members moved on to FFF-subsidaries such as StudentsForFuture or ScientistsForFuture or left the movement for good. However, not only former members confirmed the description of the organizing processes, so did new members unfamiliar with me and my project. I asked former and new members alike to provide corrections or questions for unclear interpretations. This double-check from former (retired) and new (current) members was important for the descriptive validity of my findings (Thomas, Sussman, & Henderson, 2001).

Criteria of validity: Rigorous triangulation measures ground my argumentation and reasoning (Eisenhardt, 1989). Data sampling included triangulation, using a researcher- and methods-approach. First, I gathered several data from various sources. Owing to the nature of the subject, netnography formed a major tool for data acquisition and establishing contacts, who in turn, could correct and provide feedback (Kozinets, 2015). Equally important were semi-structured interviews I held in both formal and informal ways (Gioia et al., 2013). Table 3 in the second paper and Table 7 provide overviews of the interview data. Archival data, such as newspaper articles and official FFF papers, provided a first overview and then further ground for the emergent theory (Eisenhardt, 1989). I collected all data and established all contacts on my own, however, I always presented my results and received feedback from my supervisor, Jun.-Prof.

Danner-Schröder. I received further feedback in conferences where I could participate and present my case, from such colleagues and renowned scholars as Prof. Gordon Müller-Seitz, Prof. Samer Faraj, Prof. Thomas Gegenhuber, and Prof. Daniel Geiger. These conferences were a privilege to attend, and they helped me understand the phenomenon from different viewpoints, enriching this research. I rigorously rechecked all codes to strengthen their reliability (for a similar approach, see Kozica et al., 2015). As mentioned, I collected various types of data, namely, archival, observational, interview, and netnography data. The qualitative data analysis software MAXQDA processed all data. Using this software, I completed a thematic analysis, ensuring internal validity by continuous and ongoing member checks from different members, in various locations and current roles in the movement. Especially at the beginning of my data analysis, I paid attention to using FFF language (Miettinen et al., 2009) as first in-vivo codes, to minimize research bias, using an inductive process I built and derived from the codes, to develop categories and themes (Miles & Huberman, 1994). The process of data sampling followed the approach of thematic analysis (Lane et al., 2002; Fay, 2011). The dissimilarities amongst the data categories according to the sampling rationale were significant. In the first category, the earliest local groups, organizing structures and participation fluctuated greatly. Processes regarding emergence could be identified and analyzed. In the second category, the largest local groups depicted the heaviest impacts on establishing a centralized coordinating organ and creating a national level. In the third and last category, particular groups indicated peculiarities and caesuras affecting the whole movement. This is a magnificent starting point from which to generalize theory.

Summary of the three Essays

Paper 1: Addressing grand challenges through different forms of organizing: A literature review

This paper provides an overview of organizing forms that address most complex and intertwined global problems, so-called “grand challenges,” which are most famously operationalized as Sustainable Development Goals (George et al., 2016). Great debates about the effects of organizing structures and grand challenges take place. Some scholars argue that existing organizing forms are unsuitable to address these complex problems (Ferraro, Etzion, & Gehman, 2015), while others confront this view point in favor of existing organizations (Puranam et al., 2014). Grand challenges not only affect governments and politics but the whole society and all organizations, stating the importance of unraveling such complex problems from an organizational perspective (George et al., 2016). This paper addresses the fundamental call for institutional and organizational approaches to grand challenge relations (Ferraro et al., 2015). In doing so, the paper conducts a literature review to analyze all forms of organizing to address grand challenges and their interdependencies.

Using the EBSCOhost database (<http://www.ebscohost.com>), the initial result contained 31,510 hits. Applying inclusion and exclusion criteria relevant for this review, resulted in gathering 412 relevant articles, complemented by editorial volumes (Colquitt & George, 2011; George et al., 2016) and special issues (Howard-Grenville et al., 2017) with similar foci. Followed by an in-depth analysis, 51 journal articles matched all criteria and constitute the core of this review, from which findings are derived. Figure 1 shows the review procedure.

Six different organizing forms were identified: (1) Social movements represent the least institutionalized form that can neither be expected nor seemingly contribute toward a productive goal. (2) Temporary organizations focus on targeting one specific grand challenge

with predictable temporary outcomes. (3) Partnerships aim at lasting contributions and function as an instrument to achieve sustainable objectives. (4) Established organizations depict an institutionalized character with defined structures, frameworks, and formulated outcomes, such as developing functioning infrastructures. (5) Multi-stakeholder networks address more complex problems that single established organizations failed to solve on their own. (6) Supranational organizations embody the most digital, emergent, and global approach, addressing the most complex, intertwined, and unsolved problems.

In its discussion, the paper develops a process model of different organizing forms addressing grand challenges. Figure 1 in the first paper shows the process model, which helps to explain the organizing interdependencies and relationships according to the performing actors. Findings elaborate three distinct steps how organizing forms address grand challenges: (1) Although movements are mostly perceived as a diffuse and potentially disruptive social force, they are characterized as a first impulse sender, triggering a process of change. (2) Institutionalized organizations receive the impulse and, in turn, are urged to address the criticism. Such institutionalized organizations have the capacities and resources to duly address the problem and create first infrastructures. However, along with the impulse, reception problems and conflicts arise as institutionalized organizations fail to adequately solve them, leading to conflict-laden areas of tension. (3) Emergent organizations fit in and fill gaps in institutional systems with highly specialized technological innovation and expertise. The paper concludes by arguing that the more complex the challenge, the higher the degree of necessary interaction and technological innovation becomes, highlighting organizing characteristics alongside the tackling of grand challenges.

Paper 2: Collective action as actio et reactio: Aligning organizing structures with organizational values

This paper examines the relationship between organizational values and structures within vast forms of collective action. Research on social movements focuses on many aspects, including strategies and tactics (Soule, 2012; Doherty & Hayes, 2019) but not yet on the organization of collectives (Reinecke, 2018). In this line of thought, this paper analyzes in detail how the vast social movement of FFF Germany built first structures and developed a common value system. The paper's findings reveal that in the emergent phase, FFF oriented toward their familiar environment, the political environment, to build first structures. This is rather counterintuitive, as political structures are criticized by the movement for their insufficiencies in addressing the grand challenge of climate action. Differences amplify as the movement grows and develops a common value system. Because initial structures and new values appear to be incongruent, phases of tension and fights emerge.

Organizational studies and social movement research have come a long way, progressively approximating each other's position. Traditional organizational research has classified social movements as disruptive and irrational (Tarde, 1968). However, McCarthy and Zald (1977) identify organizational characteristics in social movements by analyzing the resource mobilization that demanded some form of organizing. Further research states more organizational characteristics, such as developing hierarchies or even oligarchies (Michels, 1965), organizing principles (Reinecke, 2018; Polletta, 2002), and augmenting structures from the direct environment (Perkmann & Spicer, 2014). Therefore, organizing changes are in line with organizational values (Perkmann & Spicer, 2014). This approximation of organizational and social movement literature opens a whole new avenue of research. However, explaining

incongruencies in structure and value and their alignment over time still requires further investigation.

This paper contributes to the literature on collective action, movement participation, and organizational anchor forms. First, the paper reveals that social movements need to organize structure in the emergent phase to be able to act at all. In the case of FFF Germany this happened unplanned due to the sheer number of new members joining in an extremely short time. As other anchoring organizations do, FFF, oriented itself to the direct environment to have some structures for mobilizing and coordinating. This process is labelled as “collective actio” and has implications for movement participation in the emergent stage. Thus, with collective actio, the movement build first structures and even hierarchies. Second, as the movement grew, calls for common organizational values became louder in a phase of tension, implying that the anchor form of FFF functioned as a starting point, rather than a constant core element. Third, FFF ultimately dismantled initial structures for more value-oriented structures, suggesting unparalleled implications for organizational imprinting and values. FFF broke initially imprinted structures (and, thus, imprinted hierarchies) and transformed them into a heterarchy, conforming more with basic democratic values. This came with an active fight for organizational values, ultimately selecting the new organizing structure and form. This process is labelled as “collective reaction.” Figure 3 in the second paper shows the alignment of organizing value and structure.

Paper 3: Digital orbit of collective action: Switching between inclusive and exclusive modes of ICT in FridaysForFuture

This paper analyzes how social movements coordinate and organize digitally. Based on an inductive analysis of the single case study of FFF, it examines ICT and its effects on organizing structures. Findings depict two possible perspectives on ICT-induced effects on such collectives. Based on these perspectives, two implications result. First, ICTs are a tool to build digital structures in a configurative manner (see Figure 2 of the third paper). Second, ICTs transform organizing structures and depict interdependencies beyond the configuration (see Figure 3 of the third paper).

For many years, researchers have had grand debates about the impact of ICT effects on collective structures. According to research on ICT-supported forms, ICT impacts on collective structures broaden the width of collective forms, however they do not transform them fundamentally (McCarthy & Zald, 1977; Bruns et al., 2013). More recent studies challenge this perspective and “call for new theorizing” (Earl, Hunt, & Garrett, 2014, p. 26) because of fundamentally altered structures (Earl & Kimport, 2011). Drawing on conceptualizations from other forms of organizing, the paper scrutinizes paradoxical mechanisms. Although ICT characteristics appear to be rather open and accessible (van Laer & van Aelst, 2013; van Aelst & Walgrave, 2002; Bennett, 2003), seemingly contradictory but ultimately complementary characteristics depict closed and concentrated modes of ICT (Dobusch et al., 2019; Massa & O’Mahony, 2021, Kozica et al., 2015). These characteristics qualify as paradoxes (Dobusch et al., 2019; Schad, Lewis, Raisch, & Smith, 2016). Explaining such paradoxes and what role they play in ICT-based social movements remains open and demands closer elaboration.

This paper provides various interesting insights that contribute to the understanding of social movement structures, ICT effects on organizing structures, and movement participation and

coordination through digital means. First, the paper develops two models, based on two perspectives on ICT impacts on organizing structures. According to the structural view, the first model depicts the configuration of the social movement or in other words, how structures were built. This configuration conforms with findings on ICT-supported forms of organizing, having merely accelerating but not fundamentally altering ICT effects on organizing structures (McCarthy & Zald, 1977; Bruns et al., 2013). However, the second model, based on the procedural view, describes the participation process of people interacting within set structures. This second model reveals paradoxical and counterintuitive characteristics. Exclusive and inclusive dynamics interplay and complement each other, channeling potential productive members inward and harmful members outward. This procedural view conforms with findings of ICT-based organizing forms and contributes to understanding paradoxical interplays (Bennett, 2003; Earl et al., 2014; Dobusch et al., 2019; Massa & O'Mahony, 2021; Schad et al., 2016). Figures 2 & 3 in the third paper show the structural and procedural depiction of the digital orbit of collective action.

Areas of Synergy and Contribution

The three papers constituting this dissertation examine the effects of digital technologies on organizational structures and modes of coordination in untraditional forms of organizing. In particular, this dissertation sheds light on processes and digital means enabling properly addressing grand challenges that even established organizations and institutions have struggled to solve. The three manuscripts go beyond the research on organizing structures, values, and technological impact and seek to reveal syntheses of these research topics in the context of more complex and intertwined agendas, so-called “grand challenges.” They provide an understanding of existing organizing forms, tackling grand challenges and, in particular, how collectives, the least institutionalized form, have managed to create a vast political, societal, economic, and ecological impact. This understanding bears many important implications for other organizations and institutions. Specifically, these papers address the tackling of grand challenges in three ways: (1) The initiation of organizational and societal change merging outside formal organizations; (2) the significance of organizing structures and values in non-established forms; (3) the unique characteristics of ICTs affecting collective organizing and coordination. These three avenues of future research form an important contribution and have critical implications for the literature on organizing structures and social movements.

(1) A first area of synergy is the importance of collectives in the processes of addressing grand challenges and in solving them. All three papers show the initial force, beyond a seemingly chaotic and disruptive collective form, that can induce organizational and societal change. Results state clearly that even rudimentary forms of collective action affect organizational and societal contributions to addressing vast, complex problems. Social movements are indispensable to solutions, and formal organizations and governments must consider them.

By analyzing all forms of organizing that contribute to grand-challenge solutions, the first paper highlights the particular role of social movements in this process. Thus, collectives send at least a diffuse impulse when measures toward the solution appear to be insufficient. Thereby, collectives trigger the initial process of organizational awareness and change. More established organizations pick up this signal and react to the trigger. The second paper reveals that the largest and (to date) the most prominent social movement addressing grand challenges, FFF addressing climate action, needs as much attention and as many people as possible in its emergent phase. Although it arguably aims at disruption and lacks traditional forms of coordination, this emergent phase in particular initiates and catalyzes organizational and institutional change. The third paper scrutinizes the role of ICT in the life cycle of such a vast movement. In the emergent phase, vast social movements focus all resources on public attention, sending as many impulses toward organizations, governments, and institutions as possible, mostly (but not exclusively) through social media. From a structural perspective, the heavy and omnipresent approach via social media depicts a first configuration of the movement, where information is spread radially toward every potential receiver. All three papers reveal that in the emergent phase, forms of collective action focus all resources and attention on making a buzz without structural or organizational considerations. This phase appears disruptive and diffuse; however, it ignites and catalyzes the process of organizational, societal, and institutional change, that most complex grand challenges require.

(2) A second contribution of the three papers is the approximation of traditional organizational and social movement literature. Amplifications of the impulse for organizational change leads social movements to either dissolve, cooperate and merge with established organizations in partnerships and collaborations, or institutionalize. Growing out of the merely disruptive emergent phase, all three manuscripts showcase the development of organizational characteristics in vast and newly founded forms of collective action. As social movements

mature, it becomes harder to distinguish movement from organizational procedures for actors revealing organizing, mobilizing, and coordinative approaches that further contribute to the solution process. From this point at the latest, social movements can no longer be declared as merely disruptive, lacking organizing structures.

The first paper showcases empirical evidence and exemplifies the development and life cycle of rudimentary social movements. Thus, some social movements could develop into associations and even established organizations, such as the fair-trade organization (Kumar & Chamola, 2019), while other social movements fail to keep the momentum (King, 2004). These empirical examples from the first paper imply a life cycle of social movements, that can develop some organizational structures out of mere collective effort. However, the exact organizational development, out of emerging forms of collective action addressing grand challenges, remains unstudied and unexplained. The second paper seeks to shed light on such life cycles and organizational developing processes of social movements, attending to a vast and, arguably, the most prominent social movement development. From a general perspective, organizations must gain enough structure before failure when little-to-no structure is established. Thus, they draw on other forms in the direct environment and create anchor forms. Findings of the second paper highlight that FFF, too, oriented itself in its familiar environment and mimicked political structures. These initial structures supported coordinating vast numbers of members and mobilizing them for organized events. Coordinating hundreds of thousands of participants within set structures led to a bureaucracy with hierarchies, official role allocations, and even legislative procedures. Interestingly, traditional research states that such structural development and changes occur in the alignment of organizational values; hence value guides action (Leach, 2013). However, FFF developed such organizational structures as hierarchies, a bureaucracy, and official roles and functions, out of emergency and urgency rather than value alignment. Conversely, such first-established anchored structures became more and more

quickly obsolete as the movement matured and developed a collective organizing value that they refer to as basic democracy. The second paper develops a co-evolutionary model that we label as *actio et reactio*, displaying the alignment of organizing structure and value. First, structures are set up without considering values, due to urgency in the *collective actio* phase. Second, members across the movement heavily discuss the perceived misalignment in a phase of tension. Third, dismantling initial structures to align organizing structures with the emerged value occurs in the *collective reactio* phase. This life cycle of social movements that the first two papers analyze clearly depicts the development of organizational characteristics alongside the movement's maturation. To continuously contribute to the solution of grand challenges, social movements must develop organizational characteristics, as the empirical example of the fair-trade movement and FFF's augmentation in first official roles, functions, legislative papers, anchor forms, hierarchy, bureaucracy, and, ultimately, organizing value exemplify. The third paper uncovers digital processes coming with the development of organizing structures. So far, social movements are assumed to merely instrumentalize digital technologies for their purpose. Digital technologies and ICTs accelerate collective operations and facilitate quick information distribution, enabling making a buzz and gaining much attention in a short time. However, more recent research opposes this scale-change argument (Earl et al., 2014) and calls for new theorizing. As the results of the third paper show, social movements use ICT for scale-increasing purposes on the one hand, but, on the other, they also incorporate ICTs for organizational motives, enabling a far-reaching coordinative apparatus. Thus, this paper stresses the role of ICTs in configuring and organizing structures within FFF.

In conclusion, the three papers indicate that as vast forms of collective action mature, they develop and incorporate organizational aspects. The first paper identifies such life cycles in social movements addressing grand challenges, which failed, formed partnerships or institutionalized as organizations. The second paper reveals in more detail how first organizing

structures were built and changed in accordance with newly emerged organizing values. The third paper describes the development of a digital nationwide coordination apparatus.

(3) Summarizing the third contribution of these papers, in terms of exactly how vast forms of collective action work, this dissertation elaborates critical insights into digital organizing. All three papers state the importance of digital technologies in mobilizing, coordinating, and organizing collective action. The first paper derives a communicational technological segment to categorize forms of organizing, analyzing the relationship between technological sophistication and problem complexity. The findings of this first paper result in a process model that depicts the addressing of grand challenges. While rudimentary social movements embody the lowest degree of technological sophistication and only function as an impulse sender for institutional change, maturing forms of collectives, partnerships, organizations, and governments may receive the impulse and address the grand challenge accordingly. The process model shows that the more complex the addressed grand challenge, the higher the degree of technological sophistication must be, ultimately resulting in indistinguishably merged social and technological forms. Drawing on this process model, the second paper scrutinizes the vast netroots movement, FFF Germany, and identifies critical caesuras for the movement that digital technologies enable. The first global demonstration alone gathered around 2,2 million protesters across 133 countries. First rudimentary platforms and chats in early 2019 enabled consultation across cities and districts, ultimately enabling the publication of binding agendas and legislation. Portrayed on a timeline, such caesuras show a first glimpse of ICT-induced organizing implications, and on this basis, the third paper seeks to scrutinize in great detail how vast netroots movements coordinate and organize. The findings of the third paper reveal paradoxical mechanisms that ICTs cause, which are counterintuitive and non-trivial. As expected, and as scholars greatly analyze, ICT characteristics induce openness, accessibility, and collectivity. FFF also depicts such characteristics and welcomes new

members openly, shares information through digital communication, and decides within collective platforms. However, as recent research on other forms of organizing reveals, closed qualities, such as restricted accessibility, limited information, or top-down interventions, complement such open characteristics. The digital orbital model formulates the interplay of open and closed qualities that ICTs cause. Thus, one possible option is that ICTs become an instrument for configuring and increasing the width of the movement. This possibility is the structural perspective on the digital orbital model. The other alternative is that ICTs transform structures in an unparalleled manner. Open and closed dynamics interplay to regulate movement participation and enable digital coordination. This possibility is the procedural perspective on the digital orbital model.

Future Research

This dissertation provides several avenues for future research regarding both conceptual and empirical studies that seem worth investigating. All three papers yield emerging concepts that deserve further elaboration.

Initially, building on the first paper, forms of organizing to analyze grand challenges depict a certain process. Thus, social movements are a first impulse sender, and in the most rudimentary form, lack both coordinative mechanisms and technological sophistication. However, the third paper reveals that even in the emergent phase, collectives may heavily rely on digital technologies. Arguably, the first touching points with digital technologies were unsophisticated social media posts. However, movements mature and so does the technological infrastructure. It could be interesting to attend collectives, beginning in social media outcries and throughout the development of sophisticated virtual infrastructures with open source software, collective platforms, and programmed clients. It could be very difficult to draw a line dividing the emerging phase with social media outcries and the maturity phase with sophisticated ICT

infrastructure. Yet, further exploring the development of technological tools, mechanisms, and processes alongside the maturity of social movements would be of utmost importance and interest. Moreover, arguing that social movements are completely lacking technological sophistication becomes increasingly hard. Conceivably, social media outcries are as sophisticated as word-of-mouth promotions from early, traditional, rudimentary social movements. Attending to emerging rudimentary online-based collectives and observing not only their impacts but their very organization could be fruitful.

Second, concerning technological implementation, the first paper states that technological support is an integral part of grand challenges. The third paper supports this notion, scrutinizing the organizing advantages of ICTs. Although the theoretical groundwork of the social movement literature and organizational studies highlights the importance, as well as the possible hindrances of ICTs, future research should explore the combination of online and offline sites, balancing out the hindrances with ICT-based solutions. Besides, ICT-induced problems hindering the emergent phase or paralyzing the maturing phase, such as information overload or relevancy and validity of online data and “fake news,” still remain major road blocks and require further exploration. Exploring not only the organizing structure but also the learning processes necessary for digital and media skills, on an individual as well as an organizational level, becomes relevant.

Third, and related to the first interest, is the question of how vast forms of collective action organize and coordinate. The second paper proposes the idea that first anchored structures and forms derive from the environment in which organizing values emerge. This is interesting and counterintuitive, for all organizations and organizing forms are postulated to follow some kind of value or norm. Conversely, the second paper provides a framework where structures are first set without any value consideration. This is of particular interest for future research because it opens a whole new research venue. Emerging collectives plausibly do not need to follow a first

collective norm or value. The postulate of “action follows value” may be not a trivial, one-sided direction but a reciprocal interaction. Organizing value may emerge on established structures that, in turn, may change and align according to newly established values. This potential reciprocity of structure and value demands further empirical, especially conceptual work.

Fourth, in connection with the second paper, initially imprinted organizing anchor forms are inert and difficult to change. In case of change, external dynamics, such as augmentation, are major contributors. As findings of the second paper reveal, initially imprinted anchor forms are not only changeable but completely dismantable. Moreover, degradation is not only possible but does not necessarily depend on external factors. Based on this finding, first imprinted structures are not necessarily permanent and, indeed, can be ephemeral. Hence, even imprinted hierarchies are not immune to change or complete degradation. This depicts an interesting connecting factor for future research. More studies should further explore not only changing structures or forms but completely dismantled or renewed ones. Analyzing potential patterns in successful structural dismantling and how inert and possibly permanent anchor forms may embody fluid and ephemeral characteristics would be interesting, as would providing insights into and comparisons of externally and internally caused structural turmoil.

Fifth, and related to the above question, the dismantling process should be exploited. As the second paper indicates, dismantling is a result of heavy tensions and turmoil. While discussions about this topic agree that gaining enough stability and structure in the beginning is crucial, the second paper introduces the idea that too much structure and stability cause a setting of the course that could go either way, either terminating movement contributions or developing and strengthening the collective. Thus, how much turmoil can a social movement withstand? Or, in other words, how much turmoil is necessary in the emergent, maturing, collaborative, or institutionalization phases? Future research, both conceptually and empirically, must explore

factors and processes determining the effects of organizing turmoil that bears the potential to harm but also develop an organizing form.

Sixth, traditional organizational research states the reluctance of leaders to share power and authority. However, findings in the second and third papers imply that leaders of collectives are willing to share and give up power. Not only that, these papers introduce the idea that leaders may actively seek successors and provide them with transparent information, help, and support. Of great interest would be further investigating formal and informal authority-sharing processes in social movements. Therefore, empirical and conceptual analysis must cover both smaller and larger social movements and investigate leadership fluidity that challenges the premise of unwillingness to share authority or power.

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Figures

Figure 1: Review procedure

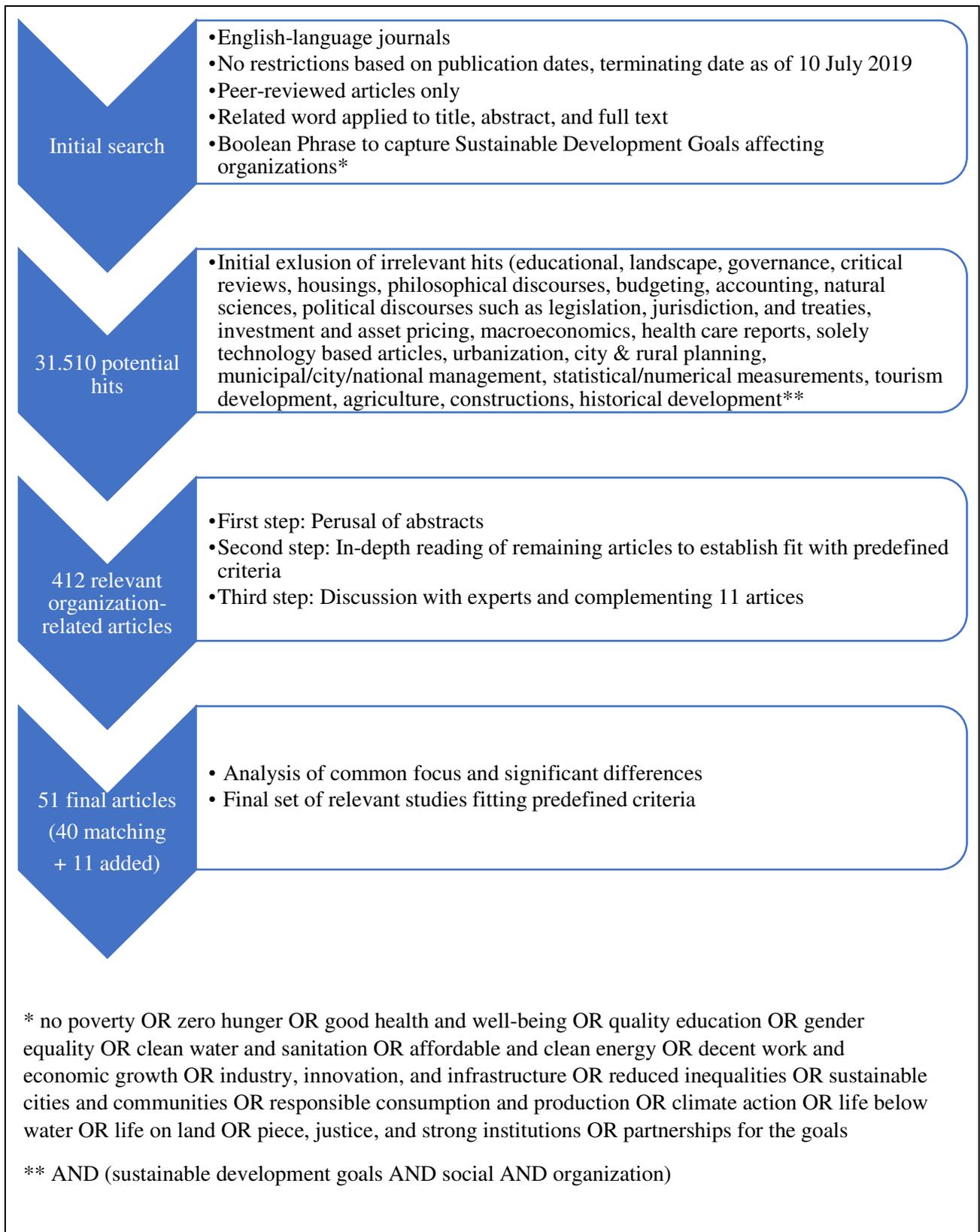


Figure 2: Data triangulation procedure

Data triangulation		
1st step: Archival data		
protocols	newspapers	FFF Wikis structural papers reports
2nd step: Observations		
<i>first participants</i>	<i>great structural influence</i>	<i>particularities</i>
Bad Segeberg, Kiel, Greifswald	Berlin, Dortmund, Köln, München	Dresden, Gelsenkirchen, Freiburg
3rd step: Interviews		
founding members of local or national groups, organizers, administrators, delegates, spokespersons of working groups and task forces, demonstrators		
4th step: Repeating		
updating from new chats and comments	exerting a more narrow and shifted focus	re-entering the field to track progress

Tables

Table 1: Number of FFF-related events

																				Total
Country \ Friday date	30 Nov 2018	15 Feb 2019	15 Mar 2019	3 May 2019	24 May 2019	21 Jun 2019	20 Sep 2019	27 Sep 2019	29 Nov 2019	6 Dec 2019	13 Dec 2019	24 Apr 2020	25 Sep 2020	2 Oct 2020	9 Oct 2020	16 Oct 2020	23 Oct 2020	30 Oct 2020		
USA	5	15	219	77	227	107	990	432	392	437	334	369	431	377	379	378	379	384	5932	
Germany	5	29	209	26	296	34	573	103	494	46	64	56	437	49	49	49	50	49	2618	
India		5	50	19	63	59	151	183	194	184	183	187	228	212	212	212	212	212	2566	
Sweden	90	41	164	74	129	74	114	178	145	116	111	120	227	123	125	125	125	130	2211	
Italy		21	278	58	193	63	87	232	167	82	82	85	92	86	86	86	86	86	1870	
UK	4	72	140	29	163	45	241	88	108	78	76	80	114	97	99	99	99	99	1731	
Canada			91	73	82	8	82	212	70	10	6	7	127	107	107	107	107	107	1303	
Spain		4	107	39	75	53	82	132	78	73	74	75	81	77	78	77	77	77	1259	
France		2	229	21	103	29	111	49	53	46	47	48	56	50	50	50	51	50	1045	
Mexico			37	14	53	25	71	65	59	47	47	48	53	48	48	48	48	48	756	
Australia	30	6	57	43	26	17	151	25	70	28	29	29	35	32	32	32	32	33	707	
Austria		2	12	5	9	6	545	12	12	7	8	7	10	7	7	7	7	7	670	

Source: FridaysForFuture (2021). Strike Statistics. Retrieved from <https://fridaysforfuture.org/what-we-do/strike-statistics/>.

Accessed on 22 August 2021.

Table 2: Summary of Telegram data, last accessed on 02 April 2022

Telegram account	Pages A4 PDF
Berlin	2,150
Köln	1,710
München	168
Greifswald	133
Kiel	103
Dresden	96
Freiburg	73
Dortmund	42
National level	20,702
Germany	4,041
Total	29,218

Table 3: Summary of YouTube data, last accessed on 02 April 2022

YouTube account	Number of videos	Pages A4 PDF
Berlin	87/ 14,5h	186
München	32/ 6,5h	87
Freiburg	14/ 3h	33
Germany	216/ 36,5h	1,882
Total	349/ 60,5h	2,188

Table 4: Summary of Twitter data, last accessed on 02 April 2022

Twitter account	Number of tweets	Number of provided media	Pages A4 PDF
München	2,470	508	373
Berlin	2,656	610	345
Dortmund	2,626	436	289
Freiburg	1,655	403	281
Dresden	2,799	272	182
Greifswald	1,421	212	151
Köln	1,145	218	146
Gelsenkirchen	846	101	98
Kiel	443	49	36
Bad Segeberg	33	19	5
Germany	3,682	748	408
Total	19,776	3,576	2,314

Table 5: Summary of Instagram data, last accessed on 02 April 2022

Instagram account	Number of posts	Pages A4 PDF
Berlin	1,149	1,000
Köln	777	672
Freiburg	527	528
München	502	480
Dortmund	527	464
Dresden	270	248
Kiel	198	224
Bad Segeberg	217	186
Greifswald	209	168
Gelsenkirchen	32	32
Germany	1,014	992
Total	5,422	4,994

Table 6: Analysis of YouTube data units

	2019		2020		2021		Total per channel	
YouTube channel	Videos	h/Pages	Videos	h/Pages	Videos	h/Pages	Videos	h/Pages
Berlin	49	8h/101 pages	18	3h/41 pages	20	3,5h/44 pages	87	14,5h/186 pages
München	10	2,5h/22 pages	16	3h/48 pages	6	1h/17 pages	32	6,5h/87 pages
Freiburg	10	2,5h/25 pages	0	0h/0pages	4	0,5h/8 pages	14	3h/33 pages
Germany	28	5h/368 pages	108	18h/877 pages	80	13,5h/637 pages	216	36,5h/1,882 pages
Total per year	97	18h/516 pages	142	24h/966 pages	110	18,5h/706 pages	349	60,5h/2,188 pages

Table 7: Summary of informal interview data

Region	FFF member	Function	Context
Greifswald	FN	Main-organizer	Team meeting, council meeting, demonstration
	FE	Main-organizer	Team meeting, council meeting, demonstration
	SN	Organizer	Cycling demonstration
	SR	Organizer	Cycling demonstration
	EA	Member	Trash collection event
Berlin	NE	Organizer	Meeting before rally, demonstration
	FN	Member	Meeting before rally
	SH	Member	Rally workshop
	SA	Protester	Rally workshop
	MS	Protester	Demonstration
	FX	Protester	Demonstration
Köln	RA	Member	Demonstration
	TS	Member	Demonstration
	DK	Member	Demonstration
	FI	Protester	Demonstration
	JA	Protester	Demonstration
Dortmund	TE	Organizer	Team meeting, demonstration
	MN	Protester	Demonstration
	MN	Protester	Demonstration
Freiburg	JA	Member	Team meeting
	AR	Member	Team meeting, demonstration
	TA	Protester	Cycling demonstration
	NO	Protester	Cycling demonstration
	TS	Protester	Demonstration
München	LI	Member	Demonstration
	NA	Protester	Demonstration
	MA	Protester	Climate workshop
	PL	Protester	Climate workshop
Total	28	4	7

Table 8: Summary of the archival data

Event	Number of units	Pages A4 PDF
Newspaper articles	22	77
FFF Wikis	95	545
FFF Pads (protocols)	12	78
Structural papers	14	239
Total	143	939

First Dissertation Paper

Addressing grand challenges through different forms of organizing:

A literature review

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ADDRESSING GRAND CHALLENGES THROUGH DIFFERENT FORMS OF ORGANIZING: A LITERATURE REVIEW

Leo Juri Kaufmann and Anja Danner-Schröder

ABSTRACT

We conduct a literature review on forms of organizing that address grand challenges, which are operationalized as the Sustainable Development Goals of the United Nations, as this framework is universal and widely adopted. By analyzing the articles that match our criteria, we identify six differentiable organizational forms: movements, temporary organizations, partnerships, established organizations, multi-stakeholder networks, and supranational organizations. These six forms are differentiated based on the two following categories: organizing segment and communicational technological approach. Our analysis shows that tackling a grand challenge often starts with collectives as a protest culture without any expected goal, besides sending an impulse to others. This impulse is received by criticized institutionalized organizations that have the capacity and resources to address the problem properly. However, new challenges arise as these organizations inadequately resolve these problems, thereby leading to conflict-laden areas of tension, wherein emergent organizations complement institutionalized organizations that have created the first infrastructure. To solve the most complex problems, a trichotomous

Organizing for Societal Grand Challenges

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relationship between different forms of organizations is necessary. Moreover, communicational technological approaches become more sophisticated as grand challenges increase in complexity.

Keywords: Grand challenges; forms of organizing; organizing segments; communicational support; technological support; process model; movements; temporary organizations; partnerships; established organizations; multi-stakeholder networks; supranational organizations

INTRODUCTION

Grand challenges are formulations of complex, large-scale, and global problems, which are sought to be solved through collaborative and social efforts (George, Howard-Grenville, Joshi, & Tihanyi, 2016). The essence of encouraging dialogues and innovative solutions has thus driven multilateral agencies, foundations, and governments to solve such grand problems collectively (George et al., 2016). Recent research covers several grand challenges, such as climate change, exploitative labor, famine, and poverty, “perhaps the most universal and widely adopted grand challenges are the Sustainable Development Goals (SDGs) of the United Nations (UN)” (George et al., 2016, p. 1881). In 2015, all 195 member countries of the UN agreed upon the 17 goals to “end poverty, protect the planet, and ensure prosperity for all as part of their new global ‘Agenda 2030’” (Howard-Grenville et al., 2017, p. 107).

From an organizational perspective, the interest in grand challenges is aimed toward forms of organizing to tackle grand challenges. Some researchers even argue that existing organizational forms are unsuitable (Ferraro, Etzion, & Gehman, 2015). However, the call for institutional and organizational change toward novel forms and mechanisms (Luo, Zhang, & Marquis, 2016) has been confronted by other scholars based on existing organizational forms of addressing vast social problems (Puranam, Alexy, & Reitzig, 2014).

This paper aims to reveal different forms of organizing to address grand challenges by analyzing and outlining previous studies. We conclude that six organizational forms – movements, temporary organizations, partnerships, established organizations, multi-stakeholder networks, and supranational organizations – can be differentiated based on two categories. First, three different segments are differentiable: designed organizations, emergent organizations, and collectives (Puranam et al., 2014); second, these forms depend on communicational technological approaches.

METHODS

We conducted a literature review to analyze different forms of organizing addressing grand challenges that have been previously studied. To operationalize grand challenges, we decided to follow the definition by George et al. (2016), who stated that the SDGs are “the most universal and widely adopted grand challenges”

(p. 1881). To ensure thoroughness and rigor, this review began with planning the architecture (Tranfield, Denyer, & Smart, 2003). Basic building blocks were established, stating inclusion and exclusion criteria (Denyer & Tranfield, 2009; Tranfield et al., 2003).

Using the EBSCOhost database (<http://www.ebscohost.com>) solely English language peer-reviewed articles were considered without restrictions based on July 2019 publications. According to the Boolean phrase, all SDGs were applied to titles, abstracts, and full texts, thereby resulting in an intentionally high number of 31,510 hits. To increase the consistency and robustness of the analysis, editorial volumes (Colquitt & George, 2011; George, 2016) and special issues (Howard-Grenville et al., 2017) with similar foci were surveyed. This survey and discussions with experts in the field added 11 additional articles. Initially, most of the 31,510 studies contained foci that were irrelevant herein. To exclude irrelevant hits, such as philosophical and solely technological discourses, legislation, jurisdiction, and treaties, EBSCOhost operators were applied (AND “Sustainable Development Goals,” AND “social,” AND “organization”). This application yielded 412 relevant organization-related articles, meeting the inclusion criteria and manifesting none of the exclusion criteria. The abstracts of all the 412 organization-related articles were initially examined, followed by an in-depth appraisal of the remaining articles to exclude studies that neglected the interplay of grand challenges (SDGs) and organizational structures for a more comprehensive evaluation.

Using this procedure, 40 journal articles matched the defined criteria, combined with the 11 added by experts, thus constituting the core of this review. Therein, the common foci and significant differences were scrutinized via an in-depth analysis (Tranfield et al., 2003).

RESULTS

Upon evaluation, we realize that six organizational forms are differentiable: movements, temporary organizations, partnerships, established organizations, multi-stakeholder networks, and supranational organizations. Moreover, we notice that these forms vary according to organizing segments (Puranam et al., 2014) and communicational technological support. As both categories are extremely important toward differentiating the six organizational forms, we briefly introduce them before outlining the various forms.

Organizational Segments

The following three segments are distinguishable: designed organizations (e.g., established corporations); emergent organizations [e.g., emergent non-governmental organizations (NGOs)]; and collectives (e.g., social movements). Designed organizations maintain the prerequisite to have a certain expectation of contribution toward a common goal. Emergent organizations seem to have some agents' contributions toward a common goal. Furthermore, collectives can neither be expected nor seem to contribute toward a common goal and hence are not

considered as an organization but remain a separate case of organizing (Puranam et al., 2014).

Designed organizations include a conglomeration of persons, some hierarchical level, division of labor, structural arrangements, common goals, and varying bureaucratic or procedural viewpoints, of which outcomes are expected (Katz & Gartner, 1988; Puranam et al., 2014). Conversely, emergent organizations have challenged this view to share a common technostructure and information infrastructure but do not have the prerequisite of pre-existing group memberships, tasks, roles, and expertise (Danner-Schröder & Müller-Seitz, 2020; Majchrzak, Jarvenpaa, & Hollingshead, 2007). However, they seem to contribute toward a certain goal (Puranam et al., 2014). While both segments are classified as organizations, collectives neither seem nor can be expected to contribute toward a common goal and hence are not categorized as organizations (Puranam et al., 2014). They are often defined as loosely organized with the sole purpose of provoking social change (Akemu, Whiteman, & Kennedy, 2016). Nonetheless, arguably, the promotion of new social ventures through media and professional associations by social movement organizations (SMOs) is an emergent organizational form and hence does not violate the condition of Puranam et al. (2014) (Akemu et al., 2016). In this case, SMOs are emergent organizations according to Puranam et al. (2014), and thus seem to contribute toward a certain goal, while social movements in their most basic forms are not organizations.

Communicational Technological Approach

The communicational approach is analyzed regarding not only the degree, closeness, and betweenness of centrality, which focuses solely on tie weights, but also the number and construction of ties, including formal and informal channels, pertaining to the interconnectedness and complexity (Opsahl, Agneessens, & Skvoretz, 2010). Hence, nodes can represent individuals in formal or informal contexts, organizations, or even countries with ties referring to formal/informal cooperation, friendship, and trade (Opsahl et al., 2010). The extent of communication approaches and organizational interaction among people increases due to complex interconnectedness, as does the emphasis on boundary or bridging organizations (BOs) and technological infrastructure (Herlin & Pedersen, 2013; Zarestky & Collins, 2017). Notably, BOs facilitate relationships between concerned parties, convene and build frameworks of trust, translate and enable comprehensible resources and information in all spheres, and mediate disputes and conflicts (Herlin & Pedersen, 2013). Technological infrastructure enables and supports organizational processes for information technology (IT) as “both an antecedent and a consequence of organizational action” (Orlikowski & Robey, 1991, p. 13). Technological support reflects digitalization, the technical specialization of functional structures, sophisticated tools, information systems (IS), dynamic market responsiveness, and the inclusion of new generation technologies (e.g., social media), thereby depicting a key component of organizational communication (Fernando, 2018; Miles & Snow, 1986). Technological support describes the use of devices for all functions. These include paying bills

(Warnecke & Houndonougbo, 2016), transforming energy resources (Thakur & Mangla, 2019), learning necessary entrepreneurial skills (Noske-Turner & Tacchi, 2016), or being updated owing to cloud computing or open data portals (Corbett & Mellouli, 2017; Wright & Nyberg, 2017).

ORGANIZATIONAL FORMS

Throughout the analysis, six organizational forms have emerged, and they are classified according to the defined categories that distinguish each form from another. Table 1 provides an overview.

MOVEMENTS

The first organizing form – movements – represents the least institutionalized and cross-sectoral form. This form not only solely consists of voluntary members but also has its administrative control entailed in external entities, such as government agencies, which can restrict the pursuit of such forms (King, 2004).

Empirical Studies

King (2004) analyzes sustainable city development in Albuquerque, USA, emphasizing the leadership role of neighborhood associations, which are a type of grassroots associations/movements in urban decision-making, bridging community members, and providing citizen input. Kumar and Chamola (2019) depict a developed social movement that has evolved into a fair trade organization (FTO), establishing new governance mechanisms in many food industries (e.g., the case of Dehradun, India) and examining production and consumption behavior. While the neighborhood associations remain a social movement, the grassroots fair trade movements do not (Kumar & Chamola, 2019).

Organizational Segment

Movements are seen as local actors' intelligent efforts to achieve local legitimacy via periodically challenging moral and material impacts, involving periods of pain, protests, and discursive translations (Lawrence, 2017). Both early movements without any degree of corporation and institutionalization can be seen as collectives (Puranam et al., 2014). The outcome of these forms cannot be anticipated and may even be disruptive, hence framing these early forms as “alternative culture” (Kumar & Chamola, 2019, p. 79). However, the fair trade movement has developed into an FTO, stating expected outcomes, and transformed into a designed organization (Puranam et al., 2014).

Communicational Technological Approach

As the least institutionalized form with a one-way interaction stream, this form has the least sophisticated communication technological approach, stating

Table 1. Overview of Organizational Forms.

Organizational Forms	Movements	Temporary Organizations	Partnerships	Established Organizations	Multi-stakeholder Networks	Supranational Organizations
Characteristics	<ul style="list-style-type: none"> • Solely voluntary members • Administrative control is external • Meetings and protests as main mean of coordination 	<ul style="list-style-type: none"> • No permanent structure intended • Focus on few or one SDG • Promotion of one agenda 	<ul style="list-style-type: none"> • Lasting contributions toward SDG achievement • Focus on one SDG • Agreement of common purpose, specific task and shared risks & resources • Public value governance instead of traditional administration 	<ul style="list-style-type: none"> • Institutionalized contribution to address one or many SDGs • Reconsidered and developed strategies of existing structures • Changing education and attitudes • Quantify progress via eco-labels and certifications 	<ul style="list-style-type: none"> • Democratic and ecological decision-making apparatus as core principle • Respond to failed initiatives of designed organizations • Social processes as mean of coordination instead of traditional command and control • Networks of Labour Activism (NOLA) • Self-helping groups of micro-entrepreneurs • Social network facilitators • Green economies/energy networks • Ecological citizenships • Communicative ecologies • Resilient networks 	<ul style="list-style-type: none"> • Meta-governed inclusion of all stakeholders: collectives, designed and emergent organizations • Ambivalent: supporting flexibility & stability, agglomeration & individual variation, hierarchy & heterarchy • Collaborative platforms • Open innovation platforms • Collaborative ecosystems • 4 Industrial Revolution organizations • Interscalar networks
Empirical examples	<ul style="list-style-type: none"> • Neighborhood associations • Grassroots movements 	<ul style="list-style-type: none"> • Projects • Consortiums • Programs • Initiatives 	<ul style="list-style-type: none"> • Public-private partnerships (PPP) • Information communication technology for development partnerships (ICT4D) • Multi-stakeholder partnerships (MPS) • Cross-sectoral partnerships (CPS) • Community partnerships 	<ul style="list-style-type: none"> • Project poverty alleviator (PPA) • Micro finance institutions (MFIs) • Social enterprises 	<ul style="list-style-type: none"> • Networks of Labour Activism (NOLA) • Self-helping groups of micro-entrepreneurs • Social network facilitators • Green economies/energy networks • Ecological citizenships • Communicative ecologies • Resilient networks 	<ul style="list-style-type: none"> • Collaborative platforms • Open innovation platforms • Collaborative ecosystems • 4 Industrial Revolution organizations • Interscalar networks

Organizational segments	Collectives	Designed (for one purpose by the UN)	Designed	Emergent & designed	Emergent (continuously evolving through interactions making outcomes hard to expect or predict)
Communicational technological approach	<ul style="list-style-type: none"> • Only one-way interaction stream • No significance of BOs • Indifferent toward ICT 	<ul style="list-style-type: none"> • Temporary stream of communication designed by the UN • Platforms as bridging tool to bring partners together, no particular organization • Consumer of ICT 	<ul style="list-style-type: none"> • Increased long-lasting interactivity to achieve sustainable objectives among partners • Introduction of BOs to function as incubator and decision-influencer, building trust, translate and enable comprehensive information • Reciprocal interaction with ICT 	<ul style="list-style-type: none"> • Higher rate of interaction throughout institutions, sectors, states, industries and communities via long-lasting institutionalized nodes and ties • Fluid role assessment of BOs; decision-making and responsibilities are completely open and diffusive • Developer of ICT 	<ul style="list-style-type: none"> • Most intertwined and complex interactions • BOs are crucial and become backbone organizations to foster communication; can function with or without lead organizations • Melting pot of ICT and human interaction with digital structures as central nervous system

indifference toward ICT, with sole personal meetings – mostly provoking change via critique – and no particular need for mediators and moderators among the stakeholders. This depicts the lowest degree of interconnectedness and complexity, following a usual phase of energizing via protests, exploring via disruptive translations, and ultimately integrating embedded practices (King, 2004; Lawrence, 2017; Opsahl et al., 2010).

TEMPORARY ORGANIZATIONS

The second form – temporary organizations – is characterized by an organizational structure that is not conceptualized to be permanent and is “[...] able to handle only a few problems, or in the extreme case, only one” (Lundin & Söderholm, 1995, p. 447). This form is not only characterized by the mere focus of one SDG but also is an umbrella term for projects (Fernando, 2018), consortiums (Watson, 2016), declarations or programs (Wysokińska, 2017), and especially initiatives (Anders, 2018; Calderòn, 2018; Weidenkaff, 2018) to promote certain agendas (Jones, Comfort, & Hillier, 2016).

Empirical Studies

Anders’ analysis (2018) of the organization Global Reporting Initiative (GRI) fosters transparency concerning environmental aspects, with European organizations being provided with concepts and standards to disclose sustainability-related data. Calderòn (2018) places the responsibility of climate action toward the global economy, urging global players to invest in new technologies for sustainable infrastructure, such as new mobility services in a multi-partner global initiative. The UN policy initiative, “Business Leaders Initiative on Human Rights” (Arnold, 2010, p. 371), incorporates human rights policies that have been reported to exist as soft law guidelines before they become hard law, committing transnational corporations to human rights protection. Jones et al. (2016) analyze the “Common Ground” initiative consisting of institutional stakeholders, such as the UN General Secretary and six of the world’s leading marketing companies, to promote health, education, and human rights. This designed initiative advertises environmental strategies to protect and create social value (Jones et al., 2016). Similarly, the initiative “Decent Jobs for Youth” (Weidenkaff, 2018, p. 26) in 2016 functions as a platform to integrate various partners – governments, youth, and civil society – to provide partner organizations with expertise and offer youth networking possibilities (Weidenkaff, 2018).

Furthermore, in targeting youth unemployment, Fernando (2018) examines the UN Program “Youth Empowerment Project [...] the first-ever multi-stakeholder alliance on action for youth” (Fernando, 2018, pp. 14–15), a global initiative to support young digital natives with skills via technical and vocational training. Wysokińska (2017) analyzes SDG implementation in a constitutional framework, a Polish program involving all key stakeholders to implement the Post-2015 SDG agenda into Polish legislature – a well-designed cooperation with allocated roles to address various SDGs (Wysokińska, 2017). The development intervention “corporate community development” (McEwan, Mawdsley, Banks, &

Scheyvens, 2017, p. 28) in South Africa is another institutionally designed interventive form, which has transformed from a simple subordinate to the private sector to a stakeholder among other actors (McEwan et al., 2017).

Similarly, in the 1990s, the US Congress established the empowerment zone and enterprise community initiative (EZ/EC), partnering with religious organizations, private industries, and community development organizations (CDCs) to revitalize distressed neighborhoods in urban US communities (Oakley & Tsao, 2007). The EZ/EC initiatives failed to meet the expectations of increasing professional and technical occupations in the service sector and hence were replaced by US CDCs, which accumulated more capital, had a stronger impact on SDGs, and were slowly rooted in urban community involvement (Oakley & Tsao, 2007). Similarly, the Nepali state disaster risk management has formed a consortium to bring humanitarian and development partners together to build resilience to external risks and hazard exposure with new modes of coordination mechanisms, such as emergency operation centers or early-warning systems (Watson, 2016).

Organizational Segment

All temporary organizations have been clearly designed and mostly part of the UN or state program to address the SDGs. However, some of them are rooted in societal structures – administrations, public governance, or foundations – and can institutionalize (McEwan et al., 2017; Watson, 2016, Wysokińska, 2017). Others remain to be examined to determine whether they have fulfilled the temporary function (Fernando, 2018; Weidenkaff, 2018) or even failed to fulfill expectations (Oakley & Tsao, 2007). Nevertheless, these outcomes are expectable and can thus be addressed as designed organizations.

Communicational Technological Approach

This organizing form depicts a temporary radial stream of communication between those that the UN is responsible for and the consortiums, initiatives, etc. (Anders, 2018; Calderòn, 2018; Watson, 2016; Weidenkaff, 2018). The platform, provided by the UN, bridges partners and facilitates working relationships without BOs, but with the use of IT (Fernando, 2018; Herlin & Pedersen, 2013).

Technological support is immanent for temporary organizations to address SDGs as they use digital transformational change by developing digital skills and green jobs (Fernando, 2018). This mere *consumption of ICT* can be considered as both the strength and weakness of such organizing forms because initiatives are based upon already existing platforms and ICT infrastructures (Jones et al., 2016), mobility services (Calderòn, 2018), open internet access (Anders, 2018), simulations, and new generation technologies (Watson, 2016).

PARTNERSHIPS

Partnerships, as the third form, correspond with the 17th SDG “Partnerships for the Goals” (George et al., 2016). This organizing form aims at lasting contributions toward SDG achievement through revitalizations, thus embedding the

collaborative action of various parties with a common purpose, specific tasks, shared risks, responsibilities, and resources (George et al., 2016; Ismail, Heeks, Nicholson, & Aman, 2018).

Empirical Studies

Pinz, Roudyani, and Thaler (2018) examine public–private partnerships (PPPs) in South Korean restructuring ports, Sri Lanka’s textile industry, and infrastructure projects in Spain. Thus, they state PPPs as an appropriate instrument to achieve sustainable objectives by shifting the paradigm in public management from traditional administration to new public value governance. This designed PPP heavily relies on another organization – the GRI – to provide sustainability-balanced scorecards for improved public service delivery (Pinz et al., 2018). The heavily technocratic form of information and communication technology for development (ICT4D) has been studied by Ismail et al. (2018), mostly focusing on the progress of digital harmony. This technology-focused partnership combines material elements – organizations, technologies, and processes – and symbolic elements – values, ideas, and discourses. Based on a Malaysian PPP, the ICT4D is considered an evolution of partnerships to address SDGs, which NGOs and governments have failed to solve in the past. One partnership in western Uganda underlying the concept of corporate social responsibility (CSR), which has evolved from “purely philanthropic actions and focus on second generation CSR” (Adiyia & Vanneste, 2018, p. 220), depicts community partnerships as linkage creators between the accommodation sector and poor neighborhood communities.

Organizational Segment

This designed organizational form can be considered an organizational instrument to achieve sustainable objectives – PPPs (Pinz et al., 2018) – or an organizational form in itself, such as ICT4D. Both perspectives, from instrumental or institutional perspectives, can be categorized as designed, contributing toward an articulated and communicated goal, thus increasing public value (Ismail et al., 2018; Pinz et al., 2018).

Communicational Technological Approach

The increased interaction can be observed through the multinational partnerships analyzed by Herlin and Pedersen (2013), examining the importance of BOs in a Danish corporate multinational foundation. Herlin and Pedersen (2013) state the role of foundations as incubators, while NGOs act as decision influencers. BOs are designed organizations that facilitate relationships between other organizations – the founding companies or established NGOs and emergent partners – resulting in a tri-part relationship of BO–foundation–NGO (Herlin & Pedersen, 2013). Aiming at a lasting partnership for the goals according to reports in India, ICT4D has previously failed due to its high complexity and conflict potential, thus emphasizing the importance of conflict management and BOs (Herlin & Pedersen, 2013; Ismail et al., 2018).

As the degree of interaction increases, the need for technological support and digital infrastructure becomes more important. Partnerships emphasize and use existing ICT infrastructure (Herlin & Pedersen, 2013; Pinz et al., 2018). However, in the process, ICT4D partnerships also provide IT, business processes, and digitally enabled services and develop a digital framework (Ismail et al., 2018). Hence, partnerships develop and advance the digital infrastructure in a *reciprocal manner*.

ESTABLISHED ORGANIZATIONS

The fourth form – established organizations – embodies a more institutionalized character developing existing strategies rather than building structures from scratch. Established organizations are characterized with a higher rate of interaction among levels of state-like public administration (Scherer, 2018), eco-innovation (Ma, Wang, Skibniewski, & Gajda, 2019), and social entities (Beck, 2017; Murisa & Chikweche, 2013; Warnecke & Houndonoubo, 2016).

Empirical Studies

Organizations, especially microfinance institutions (MFIs), have recalibrated the operational focus of shareholder value and economic growth with the emergence of SDGs (Murisa & Chikweche, 2013; Wright, Nyberg, & Grant, 2012). While MFIs have aimed at poverty reduction since the 1970s (Murisa & Chikweche, 2013), the efficiency and impact have been challenged by refocused agendas, thus importing grand challenges concerns into daily business (Wright & Nyberg, 2017). Beck (2017) elaborates on development strategies for microfinance NGOs in Guatemala with feminized policies to ensure gender equality, quality education, and the end of poverty. These policies can either solely focus on monetary aid or a rather holistic approach, providing women with cultural, financial, and environmental education, similar to the tools applied in rural Bangladesh communities (Mair, Marti, & Ventresca, 2012). Women are empowered through basic math and accounting training and lessons about citizens and property rights (Mair et al., 2012).

Similarly, Murisa and Chikweche (2013) analyze micro-entrepreneurs in Zimbabwe, with a new role being introduced – the project poverty alleviator (PPA) – imitative entrepreneurship driven by sustainable services in rural areas where traditional banks find markets extremely unattractive or risky. Furthermore, PPAs, as the holistic MFIs examined by Beck (2017), strongly emphasize education and attitude transformation to address poverty reduction, (gender) equality, and financial sustainability (Murisa & Chikweche, 2013). Social enterprise accelerators, a social enterprise with a pay-as-you-go business model, combat the low electrification rate in Sub-Saharan Africa (Warnecke & Houndonoubo, 2016). The products of such enterprises range from sophisticated grid projects, with extremely high initial costs, to home system kits that can be installed off-grid or even a pico-solar system, the easiest installation even for non-specialists. Social enterprises may not solve all developmental problems but function as

an accelerator for the public sector and institutional investments, providing an initial boost to the development of a functioning infrastructure (Warnecke & Houndonougbo, 2016).

Organizational Segment

Altered strategies, such as sustainability specialists, developed guidelines, and frameworks of existing organizations, imply a refocused contribution toward a certain sustainable goal (Wright et al., 2012). Business plans and strategies define thresholds to combat poverty (Murisa & Chikweche, 2013) or gender inequality (Beck, 2017), thus formulating an outcome to be expected and stating a designed organization (Puranam et al., 2014; Wright & Nyberg, 2017).

Communicational Technological Approach

According to Scherer (2018), the production and purchasing of public goods and environmental components of products should be internalized as fixed costs when doing business, thus being translated into organizational practice, underlying the concept of CSR (Scherer, 2018; Testa, Russo, Cornwell, McDonald, & Reich, 2018; Wright & Nyberg, 2017). Shifting the business value toward sustainable business innovation (Raith & Siebold, 2018) or eco-innovation, new frameworks guide this shifted designed organization via eco-labels, environmental certifications, and sustainable consumption and production strategies (Ma et al., 2019). Organizations with shifted or altered frameworks are sought to promote balance and communications between the global economy, green markets, and national political systems via soft policies and persuasion (Testa et al., 2018). This structure is integrated into the established firm for environmental risk reduction and value creation, incorporating SDG concerns in internal communications (Bansal, Kim, & Wood, 2018; Ma et al., 2019; Raith & Siebold, 2018). Each established organization functions as a promoter and hence a boundary element to balance global economies, green markets, and national political systems.

Established organizations addressing SDGs use and consume existing technological infrastructures, which mostly focus on mobile-based technologies to surmount infrastructural inefficiencies (Murisa & Chikweche, 2013; Warnecke & Houndonougbo, 2016). Consequently, mobile phone devices are used not only for communication purposes but also for electricity payments (Warnecke & Houndonougbo, 2016). Therefore, technological usage also drives a complete *technological reformation* and shift toward clean energy.

MULTI-STAKEHOLDER NETWORK

Responding to failed initiatives of designed organizations, multi-stakeholder networks – the fifth form – seek to address more complex SDGs with a democratic approach. Multi-stakeholder networks rely on developed or established systems (ASCI., 2018), surmounting institutions (Piper, Rosewarne, & Withers, 2017), sectors (Acelandu, Șerban, Tircă, & Badea, 2018), states (Noske-Turner &

Tacchi, 2016), industries, and communities (Venkatesh, Shaw, Sykes, Wamba, & Macharia, 2017) or communitarian ties (Islar & Busch, 2016). Networks are characterized “as a set of goal-oriented independent actors that come together to produce a collective outcome that no one actor could produce on their own” (Echebarria, Barrutia, Aguado, Apaolaza, & Hartmann, 2014, p. 29). Although the range of addressing SDGs varies considerably, all variations of multi-stakeholder networks have a democratic and ecological decision-making and participation apparatus as the core principle (Arnold, 2010; Islar & Busch, 2016; Ricciardelli, Manfredi, & Antonicelli, 2018).

Empirical Studies

Piper et al. (2017) scrutinize migratory flows in inter- and intra-regional directions revealing causes of forced labor, trafficking, child labor, and informal employment in Asia and Global South colonies. Networks of labor activism (NOLA) have been formed to integrate human and labor rights into societal frameworks (Piper et al., 2017). This emergent organizational form responds to fragmented institutional structures of migrant policies and failed initiatives, hence former temporary organizations (Anders, 2018; Weidenkaff, 2018) to fulfill the standards of decent work, maneuvering between migrant organizations and labor unions (Piper et al., 2017).

ASCI. (2018) and Mair, Wolf, and Seelos (2016) analyze a formed network of women micro-entrepreneurs and self-helping groups in rural households in Madhya Pradesh and rural villages in India to combat gender inequality and poverty with a business development strategy called the “gender energy” (ASCI., 2018, p. 65), overcoming the critique of solely focusing on a single dimension of inequality. The social network facilitators with ICT interventions, as studied by Venkatesh et al. (2017), depict network enablers, mostly ICT kiosks in rural India, to support women’s entrepreneurship and facilitate information access to combat discrimination against women. ICT kiosks, or social network facilitators, are centrally located and train women in entrepreneurial activities to ensure gender equality and create synergies with other grand challenges, such as poverty eradication. These networks surmount traditional cultural community ties and jointly use ICT to uncover institutional voids, which exclude women from market participation (Mair et al., 2012; Venkatesh et al., 2017).

When properly established, institutions are implemented, women have equal access to organizational resources, and typical functioning markets may emerge. However, if such institutions are missing, compensatory structures are needed, as depicted in the form of multi-stakeholder networks, including emergent response groups (Mair et al., 2012; Williams & Shepherd, 2016). Aceleanu et al. (2018) describe a far-reaching green economy, a local community in rural Romania, depicting an energy network involving schools, universities, NGOs, and governmental actors to reduce greenhouse gas emissions and energy dependency. This established network is directly generated by the Romanian renewable energy sector as a prompt answer to the untouched potential of Romanian developmental possibilities (Aceleanu et al., 2018). Another green economy is analyzed by

Thakur and Mangla (2019), who focus on recycling and reusing electrical waste. This circular economy in India is based on sustainable operations management, identifying key drivers along the supply chain to process eco-friendly green products among leading established Indian firms in the home appliance sector (Thakur & Mangla, 2019). The decision-making and responsibilities of ecological citizenship are completely open and diffusive. They broaden the former definition of citizenship to the new understanding, depicting social processes through which individuals and groups engage in their rights, surmounting mere legal engagements (Islar & Busch, 2016).

Considering the study of the eco-driven communities in Germany and Denmark, traditional command and control have been substituted with a certain degree of peer pressure to follow the sustainable agenda while maintaining an open dialogue that accelerates change (Islar & Busch, 2016). Communicative ecology, an intertwined designed organization of communication and informational flows, studied by Noske-Turner and Tacchi (2016), is crucial for unique projects in the Pacific Islands. Small grants for media and development projects are offered to provide new frameworks, mobilize media for sustainable outcomes, and integrate diverse networks within the Pacific context. This collaborative approach toward sustainability can also be observed in the highly democratic and self-organized networks of emergency management organizations in Macerata, Italy, as studied by Ricciardelli et al. (2018). Such resilient networks are designed to withstand external shocks via dynamic processes and community-based actions with means of self-organizing, flexibility, inclusiveness, and integration. SDGs are considered the major global instrument for reducing disaster risks, thus transforming the dynamics of traditional emergency management from simply shielding to accept and manage risk via resilience building (Ricciardelli et al., 2018).

Organizational Segment

Multi-stakeholder networks react to a failed or inadequately successful attempt to solve an SDG via established organizations or partnerships. More complex SDGs demand flexible, fluid, and democratic solutions among various stakeholders. Initially, the outcome is derived from predefined failed outcomes of established organizations and partnerships and thus could be classified as designed. However, such fluid solutions make it difficult to expect a certain result but seem to contribute to an outcome. Therefore, multi-stakeholder networks can be regarded as designed organizations because the outcomes are derived from previous failed outcomes but emerge throughout the lifespan and various processes to an emergent organization (Puranam et al., 2014).

Communicational Technological Approach

Multi-stakeholder networks seek social connectedness, dialogue, and collaborations within geographical boundaries but may also try to find consensus among divided conflict-laden spaces within political boundaries (Islar & Busch, 2016). Surmounting such boundaries, multi-stakeholder networks depict a fluid role

assessment of BOs whereby parties moderate within cross-sectoral cooperations and institutions. Owing to the increased degree of interaction, communicative ecologies, a manifestation of multi-stakeholder networks, transcend communication and information flows in a democratic decision-making apparatus (Noske-Turner & Tacchi, 2016; Ricciardelli et al., 2018).

By improving technological support, multi-stakeholder networks are characterized by not only using technology and providing computable data but also *optimizing and developing*. Available power supplies for gender equality are optimized via technical assistance software and training (ASCI., 2018). Interactive and intelligent systems support coordination mechanisms in resilient networks (Ricciardelli et al., 2018). Furthermore, clean technologies and technological innovations to process electronic waste become an irreplaceable part of the human–operational–technological components (Thakur & Mangla, 2019). Additionally, grid infrastructures for renewable energy technologies are becoming more efficient in transforming fuel-based energy supply up to 100% renewable energy (Islar & Busch, 2016). Mobilized media – the agglomeration of all social media – integrate digital technologies, using and developing both newer and older technologies. These are connected through communication modes and require high costs of learning the necessary media skills (Noske-Turner & Tacchi, 2016). Not only do digital technologies enable entrepreneurs to receive information and communicate with clients, but they also form a central location of social network facilitators (Venkatesh et al., 2017).

SUPRANATIONAL ORGANIZATION

The sixth organizational form – supranational organization (Ansari, Wijen, & Gray, 2013; Corbett & Mellouli, 2017) or interscalar network (Echebarria et al., 2014) – depicts the most digital and global approach to tackle SDGs. A supranational organization relies almost solely on sophisticated IS platforms to perform the most intertwined and complex interactions within new inter-organizational architectures, fields, and coordination mechanisms (Bogers, Chesbrough, & Moedas, 2018; Grodal & O’Mahony, 2017; Picciotti, 2017; Pollitzer, 2018). This form exhibits ambivalent support for both flexibility and stability and the inclusion of all stakeholders operating in one common central nervous system – the most sophisticated ICT infrastructure (Ansell & Gash, 2017; Picciotti, 2017).

Empirical Studies

Ansell and Gash (2017) distinguish between various platforms as collaboration modes. These platforms, which can be highly adaptive and flexible, support both stability and flexibility, with the ambivalent characteristic serving as an umbrella term to agglomerate individual action into one stream, while promoting variation as open innovation platforms depict (Ansell & Gash, 2017; Bogers et al., 2018). Open innovation platforms accumulate internal and external ideas from small- and medium-sized enterprises, multinational teams, and not-for-profit

organizations. Thus, they establish an internet infrastructure upon which social networking sites are developed, adopted, and transferred into the realm of regulated sectors such as health, energy, and transport, with the SDGs being the primary impetus (Bogers et al., 2018; Williams & Shepherd, 2016).

When engaging with public policy decision-making, collaboration platforms may evolve into collaborative governance and further into whole collaborative ecosystems (Ansell & Gash, 2017). Referring to wide-range and meta-governed platforms integrated into sophisticated information ecosystems, Corbett and Mellouli (2017) identify such cross-sectoral platforms as supranational organizations with collectives or communities, emergent organizations (e.g., formed NGOs), and public management to strive for smart water management and public green spaces. The organizational form in Q-City, a large urban area in the province of Quebec, Canada, operates from a common central nervous system – the IS infrastructure (Corbett & Mellouli, 2017). The supranational organization not only optimizes the use of scarce resources such as water but also links the three interrelated spheres – administrative, political, and sustainable – with various segments of organizing – collectives, emergent, and designed organizations (Corbett & Mellouli, 2017).

Another inter-organizational and inter-sectoral collaborative network is analyzed by Picciotti (2017) to elicit coordination mechanisms beyond community boundaries. The network of social enterprises reveals a new inter-organizational architecture with different institutions, public administrations, and enterprises to liberate land from mafia structures via the Associazione Libera Terra, an Italian social cooperative, to plead for cultural and social change (Picciotti, 2017). This “metamorphosis” (Picciotti, 2017, p. 248) of a network omits a lead organization but heavily relies on IS infrastructure as the central nervous system (Corbett & Mellouli, 2017). Such a development of networks with dynamic or no lead organizations represents the evolution of organizing caused by SDGs. It is difficult to cluster supranational organizations because hierarchy and heterarchy exist simultaneously with partial groups following a certain order and other groups operating dynamically and strictly democratically, solely bound together and orchestrated via the common nervous system.

Fourth Industrial Revolution organizations have been analyzed by Pollitzer (2018), who explores the progressive digitalization of the economy and society with ICT as its core but SDGs as the direction. Organizations aim to stop a digital divide ensuring e-sustainability to directly contribute to poverty reduction, quality education, gender equality and industry, innovation, and infrastructure through sophisticated mobile devices (Pollitzer, 2018). Through interscalar networks vis-à-vis SDGs, Echebarria et al. (2014) analyze various clusters – other innovation networks, agencies, universities, culture, policy, and technical institutes – and integrate pre-existing and emergent resources from interaction. The term scalar refers to the vertical, scalar hierarchy of relationships among this form (Lawrence & Dover, 2015). This interconnected form extracts knowledge from all the aforementioned clusters for learning regions (e.g., local councils or municipalities) functioning best in countries with high sustainability traditions such as Norway, Sweden, Italy, and Spain (Echebarria et al., 2014).

Organizational Segment

This network form involves various, perhaps all, considered stakeholders: collectives, such as groups of citizens (Corbett & Mellouli, 2017), showing no intention or expectation to contribute toward a greater goal; emergent organizations, such as those that emerged as non-profit partners (Picciotti, 2017), seemingly to contribute toward an SDG; and designed organizations, such as social enterprises (Picciotti, 2017), administrative organizations (Ansell & Gash, 2017), or city managements (Corbett & Mellouli, 2017). Thus, it solidifies the expectation of the outcome of the contribution (Puranam et al., 2014). In this open structure, beginnings of organizational lifecycles are difficult or even impossible to trace back. The involvement of all stakeholders across all organizing segments and the mere reliance on digital structures as the core of organizational existence – the “central nervous system” (Corbett & Mellouli, 2017, p. 441) – make it difficult to categorize the structures according to collectives and emergent or designed organizations. However, although supranational organizations comprise organizing forms of various segments, such organizing forms arguably seem to contribute toward the achievement of the most complex goals that continuously evolve, thereby forcing supranational structures to evolve similarly. This continuous evolution parallel to the dynamic changes of intertwined problems complicates the prediction or expectation of outcomes, although it seems to contribute toward an evolutionary fit between organization and problems, and thus, can be arguably classified as emergent.

Communicational Technological Approach

Supranational organizations are characterized by the most intertwined and complex interactions among stakeholders and sectors at all levels – social, economic, and environmental (Zarestky & Collins, 2017). This organizational form allocates projects and roles (e.g., lead organizations) but is solely meta-governed by intermediation rather than control (Ansell & Gash, 2017). Every variation of supranational organization emphasizes the importance of BOs. However, some BOs also function as critical lead organizations promoting variation, as open innovation platforms show (Ansell & Gash, 2017; Bogers et al., 2018). Such organizations must mobilize shared issues and goals to foster collaborations (Grodal & O’Mahony, 2017). Either with or without a lead organizational role, backbone organizations are crucial for the existence of supranational networks, providing strategic directions and fostering communication and dialogue in a highly dynamic and complex environment.

Technological support forms the core of supranational network activities and operations. The meta-governed collaborative platform relies on e-governance and hence distinctive software, crowdsourcing platforms, and web portals to transfer knowledge (Ansell & Gash, 2017). New major waves of technology – machine learning, quantum computing, and the Internet of Things – are constituted as future integral parts of regulated spheres in networks of energy supply and healthcare (Bogers et al., 2018). IS communities see IS or digital technology as the central nervous system with emergent technologies – simulation models, open

data portals, cloud computing, augmented reality, big data analytics, and Web 2.0 – which are essential. Mobile technologies provide highly granular information to enable seamless communication flow, which is an indispensable prerequisite for this supranational network to function (Corbett & Mellouli, 2017). Notwithstanding flawless communication flows, interscalar networks focus on learning regions to reach high sustainability standards (Echebarria et al., 2014). Supranational networks do not function without IS, not only because of automated processes, as in some established organizations, but also because emergent digital technologies are indistinguishably intertwined with this organizational form. It is impossible to separate IS from supranational networks because not only are all functions based on digital technologies but also involve the organizing form – all communication and coordination. Supranational networks can be seen as *melting pots*, merging inextricably social and digital elements into a highly complex organizational form to tackle the most intertwined societal and environmental problems.

DISCUSSION

The organizational segments become more intertwined because communicational and technological support become more sophisticated as grand challenges increase in complexity, whereas organizational segments signify a certain process to tackle grand challenges.

Starting as a protest culture, first, rudimentary movements sense a societal or environmental problem that has not been (or inadequately) addressed by institutionalized structures such as the early fair trade movement (Kumar & Chamola, 2019). No contribution could have been expected to direct the problem except for aiming criticism – which is not necessarily constructive – at the lack of properly addressing the problem. This non-organizational form, although a form of organizing, is neither expected nor seems to contribute toward a goal (and can even worsen a problem). It is thus stated as collective, sending at least a diffuse impulse, thereby triggering the process of organizational awareness and change (Puranam et al., 2014; Wright & Nyberg, 2017).

This impulse is received by institutionalized organizations, which are criticized as unsuitable for tackling SDG concerns owing to their short-term objectives and narrow attentional structures (Bansal et al., 2018; Wright & Nyberg, 2017). However, they have the capacities and resources to duly address the problem, thereby altering infrastructures or even creating new ones to fulfill the need for change, such as UN programs or initiatives in the form of temporary organizations (Anders, 2018; Calderón, 2018; Jones et al., 2016; Weidenkaff, 2018), partnerships (Pinz et al., 2018) or established organizations (Beck, 2017; Murisa & Chikweche, 2013; Warnecke & Houndonougbo, 2016). Contributions are expectable when the organizational focus is directed toward SDGs regarding the establishment or development of sustainable infrastructure and thus be referred to as designed organizations tackling grand challenges (Puranam et al., 2014). However, problems and conflicts arise as designed organizations inadequately solve problems or provide sustainable opportunities, thus leading to conflict-laden areas of tension.

Within these areas of tension caused by insufficiently addressing problems, emergent organizations fit in to complement designed organizations and fill gaps in institutional systems that have provided first infrastructures, such as digitally enabled services (Ismail et al., 2018) or even grid connections (Warnecke & Houndonougbo, 2016; Williams & Shepherd, 2016). Upon existing infrastructures, organizations that focus on the most complex problems seem to contribute toward a sustainable goal by providing highly specialized expertise in societal rights, such as NOLAs (Piper et al., 2017) or technological knowledge (Islar & Busch, 2016), and thus can be classified as emergent (Puranam et al., 2014). The more complex the problems (Wright & Nyberg, 2017), the higher the degree of necessary interaction and technological sophistication across industrial, national, and cultural borders. Furthermore, there will be more specialized knowledge of provided expertise fitting into the trichotomous relationship: a meta-governed supranational organization, of impulse sender–receiver–complement or simply put, collective – designed organization – emergent organization, as depicted in Fig. 1. Understanding this relationship contributes toward supporting political agencies, managers, and policymakers by promoting practical change agendas, alternative possibilities, and environmental awareness, thereby maneuvering organizational interventions where they are most effective and needed (Berkowitz & Grothe-Hammer, 2022; Grodal & O’Mahony, 2017; Wright et al., 2012; Wright & Nyberg, 2017).

FUTURE RESEARCH

Our findings open two research avenues that seem likely to be fruitful: organizational forms and organizing processes between organizational forms.

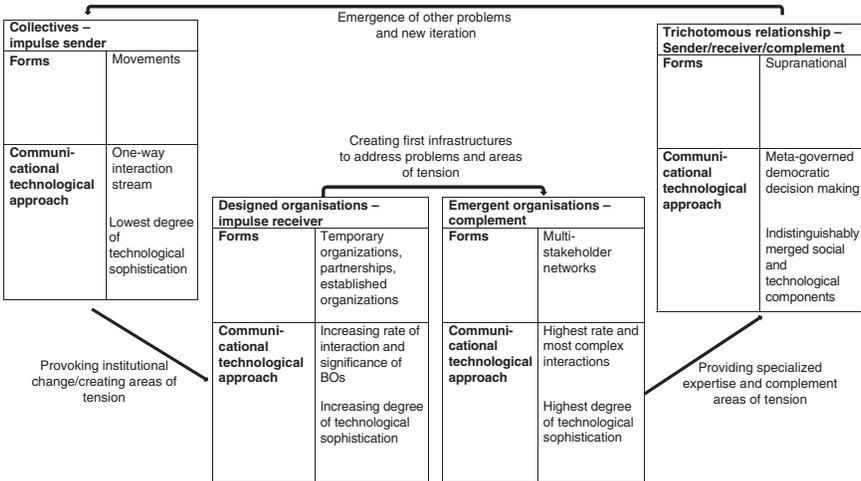


Fig. 1. Process Model of Addressing Grand Challenges Through Different Organizational Forms.

First, we call for more research on six different organizational forms. As our findings indicate, movements are essential in sending an impulse to induce grand challenge awareness. Noticeably, movements, and hence collectives, gain importance and media presence, such as civil groups fighting refugee crises or the pupils and students of “Fridays for Future.” Future research can elaborate on why and how an increasing number of movements emerge with more public presence than hitherto. While we have shown that movements make less use of technological sophistication (King, 2004), the movements fighting refugee crises and Fridays for Future indicate that technology is considerably important in organizing their ideas (Danner-Schröder & Müller-Seitz, 2020). Thus, future research can elaborate on how movements use technological resources to achieve their goals and which technologies are required. Moreover, as these rather loose connections of social interactions gain an increasing number of members in a rather short time span (e.g., Fridays for Future), it would be interesting to see how these groups develop a sense of purpose and a shared identity. Furthermore, it would be fascinating to understand how decision-making processes are established (e.g., in terms of a strategic direction) as movements usually omit traditional command and control mechanisms. Thus, which routines, scripts, templates, logics, and practices emerge? Or are they used in these groups to coordinate their purpose?

Although temporary organizations are designed for a limited amount of time (Lundin & Söderholm, 1995), it can be interesting to research processes before and after the lifespan of such organizations. Therefore, how are temporary organizations brought to life and what happens after the goal has been reached? Future research can elaborate if and how knowledge, practices, and resources can be used later by other organizations.

Supranational organizations reveal a final and trichotomous relationship within a socio-technological framework. However, little is known about how such complex forms sustainably emerge. Thus, research on how diverse organizations interact and how engagements between these organizations are ensured is essential. The core principle of supranational organizations is rather democratic. However, future research can explore these democratic processes and their sustainability or potential power struggles within these supranational organizations. Hence, we suggest focusing on coordination processes within supranational organizations.

Second, we suggest focusing on the organizational processes between the different organizational forms. Our findings indicate that collectives create areas of tension for designed organizations that consequently create the first infrastructure. Emergent organizations provide specialized expertise for trichotomous relationships. These findings suggest that one form triggers a response from other organizations. However, future research could further elaborate collaborative forms of organizing between different forms.

Therefore, studying how networks of actors from public, private, and third sectors and emerging collectives orchestrate collaboration outside and beyond formal organization (Kornberger, Meyer, Frey-Heger, Gatzweiler, & Martí, 2020) might be a promising future research area. Based on collectives, future research could analyze how movements emerge and are further transformed and

momentarily institutionalized. Thus, research could explore how institutional arrangements between different forms foster or hinder such a collective action.

Existing research acknowledges the need to link all dimensions of stakeholders (Gegenhuber, Schüßler, Reischauer, & Thäter, 2022; Kroeger, Siebold, Günzel-Jensen, Philippe Saade, & Heikkilä, 2022; Stjerne, Wenzel, & Svejenova, 2022) via various tools, such as scaffolding (Mair et al., 2016), sustainable value chain linkages (Adiyia & Vanneste, 2018), and platforms (Fernando, 2018). However, future studies should further integrate the dimensions of time and goal orientation. While traditional organizations are criticized as being too short-term oriented, new sustainable agendas, usually over a long-term goal, need to be adopted within corporate frameworks (Wright & Nyberg, 2017). Owing to their long-term nature, established organizations discount grand challenges in favor of immediate problems, while short-term effects may be neglected by social movements, thereby solely increasing existing societal tensions (Wright & Nyberg, 2017). It remains to be researched how organizing forms solve grand challenges in an ambidextrous manner, thereby satisfying both seemingly contradictory goals – short-term benefit and long-term sustainability – while also uniting actors from different cultures and standards that can complicate common understanding (Grodal & O'Mahony, 2017; Lawrence, 2017). This specifically implies the extremely fluid role and stakeholder dynamics of the most complex forms of organizing (Grodal & O'Mahony, 2017; Berkowitz & Grothe-Hammer, 2022; Kroeger et al., 2022; Stjerne et al., 2022).

We have shown that technological support is deemed to be an integral part of grand challenge solutions. However, it also remains to be examined which risks and problems are caused by more sophisticated technology in socially interwoven networks, especially where technological and social components are indistinguishably intertwined relative to supranational organizations (Ansari et al., 2013; Wright & Nyberg, 2017). Future research could explore how organizing forms combine social media with offline sites. Moreover, the management of the extensive information between different organizations and the question of when organizations suffer from wrong or extensive information because of fake news could be interesting. The question of how organizations' networks interpret such information overloads, weighing their importance and relevance, needs further exploration. Thus, it might be relevant to analyze how networks manage the high initial costs of learning the necessary digital and media skills (Gatzweiler, Frey-Heger, & Ronzani, 2022) .

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Second Dissertation Paper

Collective action as actio et reactio: Aligning organizing structures with organizational values

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Abstract

This study analyzes how contemporary collectives that grow fast in scale organize their actions. For this approach, we conducted a qualitative study of the largest contemporary social movement FridaysForFuture. Our findings reveal that in the beginning, the collective has oriented in their familiar political environment to set up structures. This was not a rational planned consideration but a quick response to the overwhelming increase in membership. We call this process “actio” as it implies a first organizing attempt to be able to act at all. However, as hierarchical structures have naturally emerged, the collective began to fight against the very same structures because they seemed to be unfitting to their collective value “basic democracy.” We call this process “reactio,” depicting the dismantling mechanisms and fight against the initial hierarchical structure for a flatter heterarchy. Our findings contribute to research on collective action by highlighting connections between organizing values, organizing structures, and emotions.

Keywords: Organizing Structures, Organizational Imprinting, Organizational Values, Anchor Forms, Coordination, Collective Action, Social Movements, Emotions

Collective action as actio et reactio:

Aligning organizing structures with organizational values

Introduction

“Fridays for future, or FFF, is a youth-led and -organized global climate strike movement that started in August 2018, when 15-year-old Greta Thunberg began a school strike for climate. In the three weeks leading up to the Swedish election, she sat outside the Swedish Parliament every school day, demanding urgent action on the climate crisis. She was tired of society’s unwillingness to see the climate crisis for what it is: a crisis” (FridaysForFuture, 2021a).

It was the first Monday of August 2018. 15-year-old Greta Thunberg protested alone in front of the Swedish Parliament for climate justice, finding support from fellow students, and thereby transmitting the idea to other nations. The initiative first began in Germany in December 2018, and by January 2019, 25,000 people had already begun demonstrating in 50 places across the country. In mid-February 2019, 155 local groups followed this movement. The first global demonstrations took place on 15 March 2019, with 300,000 people in more than 220 places across Germany, and 1,789,235 people worldwide (ipb, 2019). Within three years, more than 14,000,000 demonstrators follow the movement (FridaysForFuture, 2021b), forming a collective action toward political—in this case climate—change.

With the numbers increasing within a short period, questions as to how to organize large-scale collective action emerged. This is not just an interesting empirical question but also in terms of theorizing. Social movements often have a deep discomfort or even aversion toward any form of organizing (Clemens, 2005), as for a long time, research on social movements and activists equated “organization” with “formal, bureaucratic” structures, not fitting the values of collectives striving for social change (Clemens, 2005; de Bakker, den Hond, & Laamanen,

2017; Weber & King, 2014). As de Bakker et al. (2017, p. 204) note “organization has had a peculiar place” in social movement studies (see also Reinecke, 2018).

Initial research that focused on organizing forms of social movements can be categorized into four streams. First, scholars have analyzed how resources are mobilized within social movement organizations, which is the amalgamation of several social movements (McCarthy & Zald, 1977). Therefore, this line of reasoning focuses on organizing among organizations, instead of organizing within social movements (Clemens, 2005). Second, Michels (1965) revealed that social movements developed into oligarchies over time, as only elite members participated in organizational decision-making (de Bakker et al., 2017; Leach, 2005). However, this research was criticized as it missed the normative core, the “loss of democracy” (de Bakker et al., 2017, p. 215). Third, in contrast to the above, participatory democracy and prefigurative organizing stressed that organizing should be aligned with organizational values. Therefore, these organizational values are modeled as organizing principles (Reinecke, 2018; Leach, 2013; Polletta, 2002). Fourth, research has shown that in the emerging phase, social movements reproduce organizing forms that actors are familiar with (Aldrich & Fiol, 1994; Dacin, 1997; Perkmann & Spicer, 2014). These first anchor forms can be augmented and differentiated by drawing on other forms in the social movement environment (Perkmann & Spicer, 2014). Similar to research on participatory democracy and prefigurative organizing, anchor forms of organizing as well as the changes that follow are in line with organizational values (Perkmann & Spicer, 2014).

Inspired by this research and the question regarding how contemporary collectives that grow fast in scale organize their actions, we selected FridaysForFuture (FFF) in Germany as our case study. During the emerging phase of organizing collective action within FFF, when there was an urge to have an organizing mechanism for this massive number of members, FFF oriented in their familiar environment, mimicking political structures. Interestingly, this is

counterintuitive, as the political landscape is the very organizing form that FFF was criticizing. However, by mimicking political structures, FFF soon became a bureaucratic organization, with elite members on top of the movement (oligarchy). We label this process as “actio,” which is defined as setting up organizing structures driven by urgency rather than rational, structural considerations. As mentioned earlier, mimicking political structures was counterintuitive, as the political organizing mechanisms are against the organizational values of FFF, which emphasize the importance of acting in line with “basic democracy.” Therefore, FFF members were actively fighting against these initial organizing structures, a process we label “reactio.” This process is defined as dismantling existing organizing structures by tearing down top-down structures and strengthening bottom-up structures.

We contribute to the literature on collective action of how contemporary social movements that grow expeditiously organize their change initiatives. Our research shows that such social movements in the beginning need to organize structures to be able to act at all. However, this collective action in the beginning is caused by urgency rather than rational, structural considerations, or in order to be aligned with organizational values. This process of simple willingness to act and to create awareness of the necessary social change is labeled “collective actio.” Therefore, we contribute to research on movement participation and organizational anchor forms. In contrast, over time, the collective is actively fighting for more value-oriented organizing structures, and thus dismantling the previously established structures, which we label as “collective reactio.” This finding has implications for research on organizational imprinting, the duality of organizational structures and organizational values, and emotions in social movements.

Social movements and organizing

From destructive collective action to social movement organizations

Research on social movements has for long theorized how individual behavior is transformed into collective action (Weber & King, 2014; de Bakker, den Hond, King, & Weber, 2013). Early research on social movements constructed them as deviant and potentially destructive, acting in seemingly chaotic ways that lead to the breakdown of social order (Weber & King, 2014). The first research contradicting the perspective that social movements are irrational actors without any organizing mechanisms was based on the idea of resource mobilization (McCarthy & Zald, 1977). Accordingly, to mobilize resources, some form of organizing is required that moves the focus to social movement organizations, characterized as a “complex, or formal, organization” (McCarthy & Zald, 1977, p. 1218) and bureaucratic (de Bakker et al., 2017). McCarthy and Zald (1977) provided the example of the social movement “justice for black Americans” (more recently promoted under #blacklivesmatter), which was supported by other social movement organizations. Accordingly, the first “organizations-focused perspective of social movements” (de Bakker et al., 2013, p. 576) emerged. However, while this theorizing helped to understand relations among organizations, it did not focus on organizing within social movements (Clemens, 2005).

The iron law of oligarchy and the loss of democracy

First, Michels (1965) analyzed the Social Democratic Party in Germany, arguing that only a limited number of elite members dominate the organization (de Bakker et al., 2017; Leach, 2005). Thereby, he elaborates that mass-membership organizations, while growing, constrain the ability of regular members to take part in organizational decision-making. Instead, decisions are made by delegates who should act in accordance with the interests of the

organizational members (de Bakker et al., 2017; Leach, 2005). However, Michels (1965) observed that decision-making power tends to be used in their own interests (de Bakker et al., 2017; Leach, 2005). He concluded that socialism and democracy are structurally impossible and that each organizational endeavor ends in an oligarchy—characterized as the “iron law of oligarchy” (Leach, 2015, p. 201). In terms of organizing, oligarchy is often associated with bureaucratization, formalization, professionalization, institutionalization, and de-radicalization (Rucht, 1999). Further research elucidated two consequences (de Bakker et al., 2017), namely a loss of motivation, or “becalming” (Zald & Ash, 1966), and goal transformation as social movement members divert from the original purpose. Moreover, de Bakker et al. (2017) critique that research so far has missed the normative core of an oligarchy, which is the “loss of democracy” (p. 215).

Participatory democracy, prefigurative organizing, and organizational values

In contrast to an oligarchy and the threat of losing democracy within social movements, participatory democracy refers to an organizing form that emphasizes decentralized, non-hierarchical, and consensus-oriented decision-making, which is seen and enacted in contrast to bureaucracy (Polletta, 2002). Based on this approach, prefigurative politics suggests that movements not only depart from centralized, hierarchical forms of organizing, but organize in a way that “prefigures” the kind of society they want to bring about (Leach, 2013). In this sense, “action is guided by values” (Leach, 2013, p. 1). Therefore, prefigurative politics does not mean pressuring others to change, instead, social movement actors model the new values in their organizing principles (Reinecke, 2018; Leach, 2013; Polletta, 2002). Central to prefigurative politics is that instrumental and expressive politics are aligned, because organizing is no longer merely instrumental to movement goals, but the goals become expressive in essence (Reinecke, 2018; Haug, 2013). Recently, Reinecke (2018) analyzed the rise and fall of Occupy London. In this study, Reinecke (2018) shows how two Occupy camps

break down because social movement members attach importance to aligning the organizing principles with proclaimed values, which in these cases was inoperative (see also Soule, 2012). Participatory democracy and prefigurative organizing therefore reflect a repudiation of authority and highlight the importance of enacting the movement with the underlying values of the movement.

From imprinting to changing initial organizing forms in line with organizational values

Research has shown that in the emerging phase of any organization, founders usually orient themselves in the new organization's environment in terms of organizing forms (Stinchcombe, 1965). Most organizations reproduce organizing forms that already exist in their close environment (Aldrich & Fiol, 1994; Dacin, 1997; for the particular case of social movements, see Perkmann & Spicer, 2014). Traditional research elucidates that initial structures were imprinted on organizations (Stinchcombe, 1965; Marquis & Tilcsik, 2013), thereby focusing on the inertial force of initially imprinted organizing forms (Marquis & Huang, 2010; Marquis & Tilcsik, 2013). Within this stream of research, modification is only explained through adaptive learning (Ferriani, Garnsey, & Lorenzoni, 2012; Marquis & Tilcsik, 2013). However, since organizations are exposed to various organizing forms, they can draw from multiple forms (King, Clemens, & Fry, 2011; Perkmann & Spicer, 2014). Based on this concept, recent research indicates that organizations can augment and differentiate the initial inertial imprinted anchor form with other organizational forms in the environment. Choosing the anchor form as well as selecting other forms of organizing in the environment is enacted by aligning them with the prevailing organizational values (Perkmann & Spicer, 2014).

In general, social movements seem to have a life cycle (de Bakker et al., 2017; Rucht, 1999), starting with almost "no-organization" (Leach, 2005), rather informal, decentralized, non-

hierarchical, and consensus-oriented organizing mechanisms, in line with the organizational values (Reinecke, 2018; Leach, 2013; Polletta, 2002). However, research has also shown that despite the idea of organizing according to the underlying values, many movements adopt a more stable, non-democratic, bureaucratic (sometimes oligarchic) organizing structure as they originally envisioned over time (Rucht, 1999). Moreover, an imprinted organizing form seems to be rather inert and difficult to change (Marquis & Huang, 2010; Marquis & Tilcsik, 2013), or at least the anchor form remains and is only augmented through other forms of organizing (Perkmann & Spicer, 2014). The question is whether contemporary social movements that grow incredibly fast in scale still follow that life cycle, with almost no organizing structures in the beginning, to a more bureaucratic form of organizing. As organizational values seem to be important for social movements that strive for social change, how are changing organizing structures aligned with organizational values over time?

Case study

In 2012, Wright, Nyberg, and Grant stated that “climate change has rapidly emerged as the major social, political and economic challenge of this century” (p. 1451), where “[...] we are unlikely to see the emergence of a broader social movement agitating for the fundamental social and economic changes required” (p. 1472). This quotation signals the commencement of this research with the chosen case study FFF, given that it emerged in 2018 and has since become a comprehensive social movement, fundamentally changing social, economic, political, and environmental standards. It reflects an unforeseen organizing form of collective action, tackling one of the most intertwined and wicked grand challenges, which states, politicians, and established organizations have struggled with and failed to solve for over 60 years.

Data Collection

Traditionally, case-study research in organizational journals tend to focus on either a single case or a relatively large number of cases, balancing between the advantage of simplicity and greater potential for systematic comparison (Lawrence & Dover, 2015). We entered the field with a broad goal of studying diverse field participants approaching grand challenges within FFF Germany frameworks, choosing a small number of cases in depth in order to open up a broader range of insights than a single case study, but enabling a deeper understanding of chosen cases than a larger set of cases (Grodal & O'Mahony, 2017; Lawrence & Dover, 2015).

With this theoretical framework, as the first step of our data collection, getting familiar with our chosen case, we gathered publicly available information involving 95 FFF Wiki articles (545 pages), 12 FFF Pads (open protocols; 78 pages), 21 newspaper articles (71 pages), and 14 structural papers (StruPas; 239 pages). StruPas are considered as important archive data because they are officially legislated papers documenting the organizational structuring progress of the movement. StruPas have been published since the beginning of the movement until the end of our data collection in November 2021.

From that first broad information overview, as a second step of data collection beginning in early 2020, we performed the first observations in German cities where archival data indicated the most significance. Based on our archival data analysis, most significance could be indicated based on places where initial actions of the movement could be recognized; places that had great structural influence and formed the organizing body at the local and national levels, and places that had unique peculiarities such as certain caesuras or even terminations.

The first segment, owing to the local proximity to the founder's home country in Sweden, depicts cities with the very first participants of FFF in Germany, such as the northern cities of Bad Segeberg (the first city to be associated with FFF Germany), Kiel, and Greifswald. The

second segment involves larger German cities, which contributed heavily to the creation of and influence on national organizing structures such as Berlin, Dortmund, Köln, and München. The third segment includes cities with specific peculiarities and problems, such as Dresden, Gelsenkirchen, and Freiburg, complementing the other two segments.

In every segment, at least one city has been personally visited resulting in 144 hours of local observations and 90 pages of field notes, following a strict same-day rule to capture immediate impressions and insights that helped understand the experiences of FFF members (Gioia, Corley, & Hamilton, 2013; Langley, 1999; Miettinen, Samra-Fredericks, & Yanow, 2009). Table 1 provides an overview of the observational data.

Insert Table 1 about here

Additionally, a further and more novel tool has been employed to complement our triangulative data which is categorized as “new social media research” (Kozinets, 2015, p. 3), the netnography. Revealing interaction styles, communal exchanges, online practices, and innovative forms of organization, netnography is a major tool for data acquisition (Kozinets, 2015). Using this “native [...] born in the Web” (Kozinets, 2015, p. 245) method, we gathered 38,734 pages of social media data, most in the form of Telegram chat records between December 2018 and November 2021. Various social media and digital platforms are included in our netnography, including YouTube videos, Instagram posts, Twitter media, and WhatsApp or Telegram group chats that we were permitted to access after our first phase of familiarization and personal visits. See Table 2 for an overview.

Insert Table 2 about here

“The heart of these [qualitative research] studies is the semi-structured interview” (Gioia et al., 2013, p. 19), which is our final step. All functions and roles within FFF have been covered by our formal interviews (see Table 3 for an overview). With an average of 40 minutes per formal interview, lasting about 20–80 minutes, and 30 formal interviews overall, the final transcript involved 1175 minutes of recorded conversation and exceeded 582 pages, providing a rich source of qualitative data. Additionally, 28 informal interviews covering 28 pages complemented our findings. In light of the sensible political topic of our researched movement, the data collection process guaranteed full anonymity to our interviewees, which will be mentioned by randomly chosen initials when quotes and references are used.

Insert Table 3 about here

Finally, we iteratively repeated step three, netnography and updates from new chats, comments, and documents with step four and two, interviews and observations, with a narrower and shifted focus throughout the data collection (see for a similar field entering approach Grodal & O’Mahony, 2017).

Data Analysis

Our data analysis progressed in four steps. First, since we were interested in how FFF was organizing collective action, we coded all related information with in vivo codes using the language of FFF to comprehend their way of acting and thinking (Gioia et al., 2013). Moreover,

we displayed organizing actions on a timeline (see Figure 1) to see how organizing efforts developed over time. Timelines are a useful method for representing and visualizing information in chronological order to provide an overview (Langley, 1999). By analyzing these organizing aspects on the timeline, we surprisingly realized that at first, FFF members were setting up organizing structures, and later, they were found dismantling the same structures.

Insert Figure 1 about here

Building on this first insight, in the second step, we coded phases where FFF members first set up structures and later dismantled them. We followed an inductive coding approach (Miles & Huberman, 1994) to analyze why and how FFF members were setting up and dismantling organizing structures. This analysis revealed that FFF members in the beginning were calling for more structures, as everything until then was very chaotic. Based on these calls, FFF members mimicked political structures that they were familiar with. Conversely, FFF members later tore down top-down structures and instead reinforced bottom-up structures, thereby dismantling the structures that were set up earlier (see our data structure and empirical evidence in Tables 4 and 5). However, while analyzing these mechanisms, we noticed that the process from setting up organizing structures to dismantling them was by no means a smooth process.

Insert Tables 4 and 5 about here

Therefore, in the third step, we analyzed this phase of tension. While coding the data of this phase with an inductive approach (Miles & Huberman, 1994), organizational values gained

significance. By referring to the value “basic democracy,” FFF members were expressing their dissatisfaction with the current organizing structure. Nevertheless, in the beginning, the majority defended existing hierarchical structures. However, the perception of hierarchical structures and value orientation shifted slowly but steadily until the pressure for less hierarchical and more value-oriented structures increased (see our data structure and empirical evidence in Table 6).

Insert Table 6 about here

In the last step, we were interested in learning whether and how organizing structures and values influence each other. So far, we know that there is a close relationship (Greenwood & Hinings, 1988; Hinings, Thibault, Slack, & Kikulis, 1996), but there is also a strong tendency that structure affects values (Kraatz, Ventresca, & Deng, 2010), not vice versa. However, by analyzing the process of shifting from a bureaucratic to a value-oriented structure, our research shows that organizational values influence the evolving organizing structure. Yet, this process was far from being an easy transition; in contrast, it was an active fight for more value-oriented organizing structures and less hierarchical ones. Therefore, we labeled this process “reactio” as it was a clear reaction to the organizing structures set up so far. In contrast, we labeled the first phase of setting up structures as “actio,” to reflect a simple attempt to have any organizing form caused by urgency rather than rational, structural considerations.

Results

First, FFF students had little to no experience in organizing and were overwhelmed by the influx of interested people, who called for any organizing structures. Therefore, the first members used their background in politics, mimicking this organizing form, a process we label “collective actio.” As an increasing number of people pushed for flatter and more transparent structures, the collective organizational value of *basic democracy* came to the fore. We call this process of dismantling existing structures and crystalizing the collective value as “collective reactio.” This collective reactio was triggered by criticism which gained momentum and was amplified along a phase of tension fighting for the idea of a basic democracy:

“We are a movement without a face” (TA, admin FFF München)!

Collective actio: Phase of setting up mechanisms

At first glance, FFF appeared like a sole protest movement, demonstrating against established institutions, governments, and industries. This initiation at the end of 2018 was marked by a “very open and highly unstructured [approach]” (FA, organizer München) with “very few voted persons” (TA, admin München) or simply put, being “chaotic” (NO, member Kiel).

On the lines of the FFF founder, one girl started the FFF movement in Germany in December 2018 as LA, main-organizer Bad Segeberg, the first associated FFF group in Germany, remembers:

“[...] everything came from her. She also asked her mother to post it on Twitter. That is how it occurred, how people noticed it [...] and that is how it has developed.”

Calling for an organizing structure

Striving to mobilize more people, FFF has trickled down in every German region, where, to date, over 500 local groups represent German counties, cities, and even districts (FridaysForFuture, 2021c). The initial steps of FFF Germany involved agglomerating as many people as possible and simply making a buzz:

“[...] a lot by word of mouth, stickers on schools, people [...] have advertised and also brought a lot of friends with them” (EE, main-organizer Kiel).

“The first aim was to get many people in [...]” (VT, co-founder Kiel).

No organizing mechanisms were implemented or planned in advance. People, mostly students, came together to protest using word-of-mouth, recommendations, first social media posts, and invitations by friends, as VT, co-founder Kiel, explains:

“I was in school and saw an announcement on Twitter for such a strike [...] I forwarded it and within a couple of hours, blazingly fast, a larger WhatsApp group was founded [...]”

“The WhatsApp groups filled super quick” (LA, admin Freiburg) and because “none of us had experience” (CA, founder Dresden), the hitherto untrained students and FFF members had to:

“[...] plan, how to continue. Then we had our organizational meetings, which, for example, were first held at home” (LA, main-organizer Bad Segeberg).

Simply agglomerating as many people as possible led to initial calls to establish structures, allocate responsibilities, and act more organized, which overwhelmed the first FFF (founding) members:

“[...] it was way more open and unstructured” (FA, organizer München).

“We noticed that we as students, being not a very small group but relatively unexperienced, we cannot possibly get such huge projects going only by ourselves [...]” (FA, delegate Köln).

Therefore, FFF members were urged for more structure in a very short time frame without any pre-existing expertise because of increased dissatisfaction and criticism:

“[...] in general very unsorted [...] a handful of slob here” (FFF Germany chat log).

“At the moment, those are anarchic structures” (FFF Germany chat log).

This logistical problem urged FFF members to respond and implement first organizing mechanisms in order to organize the wishes, opinions, and concerns of hundreds and thousands of people at each local group:

“[...] the more complex [...] the tasks, the more complex the structure becomes” (FA, organizer München).

“I think setting up organizational forms and communication channels is legitimate” (FFF Germany chat log).

Mimicking political organizing structures

In light of the political activity and the interest of some FFF members, first structures were introduced that were based upon and derived from democratic institutions, such as the German Parliament:

“I think there were many things people knew from other groups. I think very little emerged from our plans to get together and say ‘we think of something very new,’ but we have a lot of people with many backgrounds, from politics or NGOs, etc.” (FA, organizer München).

In mimicking the political landscape of Germany, leading to councils, legislatives, delegates, national and local divisions of power, first waves of thousands of members could be managed as VT, co-founder Kiel, explains:

“The group has filled within an hour with a hundred people [...] later, structures have emerged, delegate systems, discussion chats for various topics [...]”

“Just like in a democracy, like in a state parliament” (EE, main-organizer Kiel).

This process of mimicking created the first organizing structures and functional relations that are documented in official organigrams (see Figure 2):

“There is a public list with all working groups (WGs), delegates, and local groups with contact persons [...] an organigram is a possibility to recognize or rather contact responsible persons” (StruPa v.0.9).

Insert Figure 2 about here

Reacting to the problems of unstructured and fluid member dynamics, FFF members began to propose and hold personal meetings in early 2019, similar to parliamentary sessions, as HN, main-organizer Freiburg, recalls:

“In the beginning it was so unstructured! We had a [plenary] meeting once a week and everything else was done privately at home, but eventually we were too many people [...]”

The meetings, usually held in a public place were a critical organizing pillar for FFF Germany, from which further, more detailed and grained mechanisms have emerged, as HN, main-organizer Freiburg, continues:

“[...] and there we thought, ‘well, then ... we could also found WGs,’ then it is way easier, and every WG has its own WhatsApp group [...].”

Garnering increasing attention and members, the first founders of local groups began to exchange information, plan meetings, and create first networking structures, spreading from the largest regions in Germany to the smallest towns and districts, as HN, main-organizer Freiburg, further elaborates:

“So, last year [2019] was really crazy, how, all of a sudden, everything connected, and how much inflow all the organizations received.”

Mimicking the German Parliament, StruPas, that is, officially legislated papers documenting the structural progress of the movement, and local or national separations have been constituted:

“We actually borrowed this word from politics, whereby ‘our’ separation of powers solely arises from grassroots democracy” (StruPa v.1.0).

The separation of powers between local groups and the national level is constituted within the first quorate StruPa v.1.0 allocating the mapped roles:

“Every local group is independent and self-administered [...] and determines their own delegates. [...] The conference of the delegates (CoD) is a central interface for the exchange between the local group and the national level [...] The communication task force (CTF) organizes the internal communication [...] Every WG has to define its own competencies, which in turn has to be approved by the CoD [...] The conference of working groups (CoWG) is a collective mouthpiece of the WGs. Its tasks involve [...] the control of CTF members.”

“It was, principally, a relatively bureaucratic process of establishing more and more new committees” (AX, admin Dortmund).

Therefore, groups focusing on a specific task became the so-called WGs with corresponding spokespersons and local members conglomerated within general local groups. For reasons of logistics, each local group had delegates, elected local representatives, who connect on a national level via their own platform CoD.

Defined roles, competencies, and relations within this local or national separation depict the first characteristics of hierarchies, as MN, admin Dresden, clarifies:

“[...] national level, it is practically this council consisting of delegates [CoD] which is the highest decision-making committee of FFF Germany. And then [...] there are the WGs [...] they autonomously create concepts and present them to the CoWG. [...] In that sense, more or less, regarding the impact, [the CoWG] is the second highest committee.”

These setting up mechanisms, derived from calls for more structure and organizational mimicry, created the first manifested structures. Accordingly, FFF Germany has fostered loose processes, opinions, and contributions to manifested frameworks and reliable organizing structures.

Misalignment of organizing structure and organizational values:

Phase of tension and value-orientation

Along with the establishment of the first functioning organizing framework, hierarchies have naturally emerged. Criticism has started from the very beginning with a few people denouncing recently established structures, as exemplified by the FFF Germany chat log:

“Everyone who feels they belong? That is difficult.”

“FFF was not planned to be organized centrally or democratically, rather organic and chaotic. The ‘leading‘ persons have crystalized through the choice of the press.”

However, as time progressed, chats were filled with thousands of opinions and discussions about the emergence of hierarchies, manifested structures, strict mechanisms, and public figures. Although first minorities highlighted the problematic and anti-basic-democratic attitudes right from the start, many others have defended such public figures and organizing mechanisms, owing to the perceived benefits of structural stability and having competent public speakers.

Defending hierarchical structures

Especially at the beginning of this phase, many members forwarded tasks and questions toward public figures (who can be referred to as founding members) for they worked the most and embodied trust due to recognition.

“I am LX and I have an overview over the actions in Berlin” (FFF Germany chat log).

“LX definitely, I do not know the others” (Berlin chat log).

“[...] because they are the pillars of the movement” (AY, FFF messenger app).

Encouragement also came from FFF Köln, which will have developed a very critical and even resentful attitude toward hierarchical structures in the near future:

“But I think that not the collective but the individual should be the focal point [...] I think JB did a great job” (Köln chat log).

Throughout the discussion about public figures, coherent discussions about hierarchical structures have arisen. Arguing in favor of hierarchies and static positions, members claimed:

“One has to rely on organizational agreements for the smooth functioning of an organization. So far, there is always a need for obligations to abide by the agreements [...]

because otherwise the organization collapses. Obligation is inherent and voluntary” (national level chat log).

“[...] in our system it is very difficult to function without hierarchies” (LA, admin Freiburg).

However, the voices criticizing such organizing structures have become louder and more present, shifting the relation between critics and defenders as well as the perception of FFF structures.

Changing perceptions about hierarchical structures and focusing on value-orientation

Perceiving FFF structures as undemocratic, some organizers, members, and users complained:

“Especially at the national level a small group of people has emerged, who worked in a non-transparent manner and who have a lot of power” (FA, delegate Köln).

“LX has done great work, however, she has not been legitimized for FFF and she has not really gotten the approval by the base, and that of course is unacceptable” (Berlin chat log).

“[...] the question is, is everything done at the national level democratically legitimized, and this is definitely not the case” (Berlin chat log).

The sentiments of some people, who were once trusted and appreciated, having too much power, have increased gradually and successively, as TE, main-organizer Dortmund, recalls:

“And it has changed a little bit, to people who have gained too much power because they were active in too many WGs and therefore had access to too much information and somehow gained a certain level of respect and connections and got into the position that their opinion has more influence.”

“She [LX] neither has more influence than others nor is she, in any sense, our leader”
(national level chat log).

FFF members have turned bitter and resentful about the hierarchical distribution of information and influence, stating:

“[...] structurally, we can do whatever we want, it will not change a thing [...] It [discussion] was mudslinging” (AY, founder FFF App WG).

“Those [founding members] have worked fairly aggressively with publicity and have worked their way up to this position. That is not the point of how FFF is built [...] where every individual has the same right to decide” (AX, admin Dortmund).

In the midst of the outburst, the call for “basic democracy,” the major organizing value of FFF Germany, has become immanent:

“[...] to seek, how can we improve our structures, how can we become more transparent, more basic democratic [...]. That is how the idea emerged [...]” (LH, organizer Berlin).

“[...] we are a basic democracy without hierarchies. But in reality it looks different” (LA, admin Freiburg).

“The collective is what is strong” (national level chat log).

Pressuring for less hierarchical and more value-orienting structures

One important peak of concentrated criticism was the open letter addressed by FFF Köln in the German FFF Telegram group claiming:

“The personal cult leads to the insufficient representation of our viewpoints in order to avert the climate catastrophe.”

This open letter has been quickly acknowledged by the FFF base:

“[...] the open letter [...] has enabled many people to hear others’ points of view [...] and giving people [...] a feeling of not standing on their own [...] I support the local group Köln 100%” (FFF Germany chat log).

This key component of FFF Germany, the galvanization of thousands and thousands of opinions and viewpoints into concentrated collective action for political and societal change, is perceived to be undermined by the power ambitions of those individuals who have forged FFF structures at first place. Therefore, FFF members called for value-oriented structures that fit the idea of basic democracy:

“We really need to work on a basic democratic structure” (FFF Germany chat log).

“So far, it has been more of our collective failure, not having built basic democratic structures and not having tied down our principles much further [...] those mistakes can be corrected and I am confident that it will succeed in the upcoming months [...] FFF is the basis and without the basis the gatekeepers are powerless” (national level chat log).

“A few have come up with some static hierarchies which do not fit our way of operating and caused many crazy problems... the structure [hierarchy] has been pushed through [...]” (national level chat log).

“The movement needs to consider the structural setting of the course in the near future, because it is obvious: Yes, there was success in elevating climate topics into public discussions [...] but that is it” (national level chat log).

Aligning the agenda of climate action with the aim value of basic democracy, FFF members focused on collective decision-making rather than individual expertise or as SN, organizer Greifswald, put it:

“[...] we are but young people who have interests but we are by no means huge experts, we are well-read and try to get the most intelligent and proper result [...].”

“We need an open discussion culture” (FFF Germany chat log).

This rather humble self-depiction is shared not by rules, but is disseminated through the collective FFF belief system, which has been the major driver for every legislated StruPa since v.1.1.0:

“Basic democracy—the local group decides accordingly to the time available as democratic as possible.”

Finally, FFF members collectively called for flatter hierarchical structures:

“[...] even those people, who defended the structures of [...] the national level, had to admit that change is due and that the hierarchies are by no means flat“ (TE, main-organizer Dortmund).

“In the beginning it was obvious that LX functioned as a figurehead of the movement, at the very top, as a national organizer. Initially, it was quite complicated with basic democracy. In the beginning, we needed a couple of people who were well informed and who called the shots. Now, there are hierarchies of knowledge that need to be dismantled. The simple activist, who receives information on social media [...] does not know, what organization is behind it” (JS, admin Berlin).

“This would be the beginning of the end of the movement. We stepped up to provoke politicians to act or terminate this economic system, and not to acquire the best position in such a system” (national level chat log).

The desired changes can be summed up in one post:

“All I want are five things: Dismantling hierarchies, creating transparency, good accessibility, supporting basic democracy, and stopping personal hype” (FFF Germany chat log).

Collective reactio: Phase of dismantling mechanisms

In this final phase, the movement seeks “[...] an organizational form where the group can, as a collective, decide” (national level chat log). To prevent the undermining of FFF Germany’s core value basic democracy, the phase of the collective reactio in late 2019 and 2020 is characterized by establishing dismantling mechanisms. These check and counterbalance the lack of transparency, information inaccessibility, and hierarchies. The phase of discussion has evolved simultaneously with the introduction of dismantling mechanisms and has not ended in late 2019. Dismantling mechanisms can be classified as tearing down top-down structures and strengthening bottom-up structures.

Tearing down top-down structures

The first documented and legislated dismantling measurements addressing and trying to solve the structural problem can be examined early in StruPa v.1.2:

“After the request of the CoD, the CoWG has to give account and in-depth report, whenever a 1/3 ‘atmospheric picture’ majority has been reached.”

Regular reports, new platforms, and accountability checks noticeably limit the power and competencies of the CoWG (national body). Therefore, the newly formed platform “atmospheric picture CoD” is capable of urging the CoWG to provide accountability at any time, in addition to the provided report every fortnight:

“The CoWG gives account about their work via report every two weeks” (StruPa v.1.2).

However, only after the loud call for less hierarchical structures in the phase of tension, StruPa v.1.5 legislated transparent and basic democratic procedures, binding the movement:

"[...] to provide a public telegram channel [...] of which the following formats are shared: CoD protocols (short reports), WG reports, and announcements."

FFF-related elections were not only protocolled but publicly shared, documenting the decisions made by WG spokespersons and delegates:

"[...] urgent decisions are communicated to the delegates. The delegates forward the question to their local groups. The local group decides under the consideration of time as democratically as possible. The delegate provides prompt feedback regarding the process" (FFF Wiki).

"Protocolling, when done properly and exhaustively, is also a tool to dismantle hierarchies" (FA, organizer München).

However, "[...] in a constant rhythm to rotate the people" (LH, organizer Berlin), more events and plenaries were publicly held and protocolled, and functions "[...] split in a manner that the same person does not do everything but every time someone else" (FE, main-organizer Greifswald), "[...] making the election process more transparent" (ME, admin Dortmund).

This basic democratic orientation is exemplified by FFF Berlin, the largest FFF group concerning membership and organizing impact, which officially published two dates in 2019 for open elections. In this time span of three months (June 2019–September 2019) with open plenaries and one invitation toward elections of delegates and transitional delegates, the group has published only two occasions publicly. In contrast, in a comparable time span from July–September 2020, using the digital tool Pad, ten publications were made, involving elections concerning coordinators, WG election commission, WG structural help, delegate teleconference, press spokesperson, and report spokesperson. During this period, WG

spokespersons were voted in four, functional spokespersons in three, and delegates in two elections, contrasting the low election and publication frequency of early 2019 (Berlin chat log; FFF WG, platform protocol).

The frequency and duration of elections is not legislated in a StuPa because it is highly dependent on the local and time context, giving all power to local groups to determine their delegates. Smaller groups usually hold on longer to their delegates for declining membership and participation is a major concern, but many active groups agreed that:

“[...] three months are set. This is because we have a moderately medium time. Therefore, it makes sense, having a certain duration in order to familiarize themselves with the flow. However, it is of course good that it is checked regularly” (TE, main-organizer Dortmund).

“Every local group votes every three months or so” (FA, delegate Köln).

From a national perspective, WG spokespersons are elected even more frequently and extraordinarily, incorporating a new election even after one week, as MN, founder Bot WG, explains:

“[...] lastly it goes like that, there is a short application phase, which currently lasts three days [...] and then the WG spokespersons vote an election officer [...] who in turn conducts the election.”

CTF members, moderators at the national level, are characterized and obliged solely by extraordinary elections when members can propose candidates at any time. This consensus has also been reached after phases of dissatisfaction about the CoWG [national body] having too much power:

“The election of CTF was completely organized via the CoWG. [...] The CoWG admits that not all criteria for candidate selections have been published. Overall, we find that the current

procedure is too untransparent, for example, the ‘secret consortiums’ and why some persons were selected for closer elections. Our opinion is that not only CoWG proposed candidates should be electable” (FFF Wiki).

Furthermore, some positions have been completely canceled, focusing on “[...] decoupling people of consortiums” (AY, founder FFF App WG), with the example of the political spokesperson as TA, admin München, clarifies:

“There is no longer the position of a political spokesperson.”

The newly voted delegates, spokespersons, admins, and main-organizers all share the same sentiments, internalized via the basic democratic value, of dismantling any emerging hierarchical structure and being willing to be replaced by new members to come. LA, admin Dortmund, expounds:

“I have a hunch that I have a hierarchy, and I try to dismantle it by saying, ‘yo, if you have questions or anything else, if you do not know how things work, you are new in our local group, I can explain it to you. It is not a problem.’ I gladly invest time in it because I want to break down the hierarchy. And I see all the others, who try to dismantle their hierarchies [...] meaning, being always there, answering questions, if there are any, undertaking tasks together.”

“We can limit the power via limiting the duration of the representation of [...] functions” (national level chat log).

Tearing down top-down structures has been achieved via dismantling mechanisms such as high frequent and published votes (delegates and WG spokespersons), transparent reports (on results from CoDs, CoWGs, and CTF procedures), competence limitation (of WG spokespersons), functional termination (of political spokespersons), regular and extraordinary approvals from the CoD (thus local groups), and extraordinary elections (of CTF members). The larger the

concerning group and the higher the member's rank, the more frequent (and, in some cases, extraordinary) the election and rotation.

Strengthening bottom-up structures

“Simply strengthening local groups, this would most likely counteract hierarchies” (national level chat log).

This orientation toward stronger bottom-up structures can be observed in one of the most important mechanisms, the plenary meetings. First, local discussions gave an advantage to experienced speakers who talked longer and more eloquently, resulting in uneven proportions of speech time. FFF has adjusted this issue by giving a fixed time to discuss in a previously published agenda or how FA, delegate Köln, admits:

“[...] at the beginning of FFF, it was a little undemocratic, and we, as a local group, tried to stop that stringently.”

People were stopped who were omnipresent, while encouraging others to participate who have not had any experience at all, as LA, admin Freiburg, explains:

“[...] every person gets a say, for example, we take people who have not said much or we stop people who speak a lot.“

“[...] people are specifically encouraged to have a say, to get into such press interviews and to shun reticence” (EE, organizer Kiel).

People are encouraged to assume responsibility in new areas for the sake of having a variety of potential members to represent FFF in all spheres as ME, admin Dortmund, states:

“They always try to include everyone, introducing people to new tasks.”

“[...] that is why nearly all of us are able to do the same and to support, when someone cannot do it yet” (FN, main-organizer Greifswald).

Lastly, in StruPa v.1.8, such common beliefs were manifested in the form of principles:

“All members are treated equally and we act basic democratically. The StruPa shall be organized adhocratically and promote activism [...] Explicitly, these are directives, principles, or guiding notes but no hard rules.”

From that caesura, meta-fundamentals and guiding principles were at the very top of every StruPa. After over one-and-a-half years, FFF Germany’s core value, basic democracy, has become constituted as a principle. Structural processes, projects, and tasks have to match this value of basic democracy by FFF legislation with “other representatives and other voices, showing that this movement is diverse” (FFF Germany chat log). Such a structural change is more time consuming but necessary, as ME, admin Dortmund, explains:

“[...] basic democracy it is our claim but of course it is also totally time-consuming and yes it is always associated with a lot of effort but is just a necessary process.”

These guiding principles depict the wish for less and flatter hierarchies and power distributions.

They were divided into three segments:

- Diversity, “creating a functioning movement with as many facets as possible to reflect the FFF structure”
- Empowerment, “supporting all members in acquiring the possibility to express their voice”
- Sustainable activism, “supporting all members in long-term and unproblematic activism practices” (StruPa v.1.8).

National guiding principles and directives regarding local or even nation-wide demonstrations are not binding; thus, dates for demonstrations can be chosen by each local group individually. This leaves all decision-making power to the local actors for they “[...] must somehow be able to react spontaneously” (TE, main-organizer Dortmund). However, most of the local groups agree upon one common date to have the largest impact, leaving room for deviance for some few local groups to participate on other dates, or how SN, organizer Greifswald, put it:

“FFF is not an association but [...] there are calls from the national level which we fully support. Well, most of them, because there are details one can always argue about. However, we support the major claims and adjust accordingly. But, there are no real demands [in this regard].”

On 30 October 2020, the final move to dismantle hierarchical imbalances for the sake of more transparency and basic democracy was made, for “transparency solves some hierarchies and hierarchies always have to do with intransparency” (LA, admin Dortmund). This legislation resulted from long internal pressure phases and was presented first as an extraordinary proposal by FFF Kiel, terminating public figures with close relations to politics and the media:

“The local group Kiel submitted an extraordinary proposal, under which persons, who run for a full-time mandate, can no longer represent FFF publicly [...] The local group Kiel has submitted a second proposal which proposes that the entrance in nationwide WGs and sub-groups is facilitated regarding the execution of their tasks via more transparency” (StruPa v.1.9).

The first part addresses the exclusion of all members from FFF-related public representations who serve as full-time members of German parties, which is a direct reference to German figureheads, while the second part states a very low threshold for new members to be able to participate in WGs, local groups, and sub-groups. Both extraordinary proposals were accepted,

and after nearly two years of FFF Germany, politically active full-time members were excluded from FFF public representations by FFF legislation. Reports and frequent rotations both interplay to maximize organizational transparency, addressing the grand challenge of climate action, without formal or third-party instances of control as VT, co-founder Kiel, summarizes:

“[It is] a matter of transparency, simply to make visible what we do [...] in order to avoid redundant work or enable others to have a look inside [...] and that they do not work in silence, because in a sense, this is a kind of control.”

Lastly, FFF Germany has managed to strengthen bottom-up structures via fixed agendas in meetings, encouragement and support, and skill and knowledge sharing, to create a structure where “[...] interests and voices arise from bottom to top and applications from top to bottom” (national level chat log). This flat hierarchy allows flexible local decision-making, as FN, main-organizer Greifswald, illustrates:

“[...] the national level sets something up, nation-wide projects or so, then Greifswald appears and does something completely different.“

Discussion

The paper began by asking how to organize collective action when the number of followers grows incredibly fast in scale in a rather short time frame. Traditional research on social movements suggests that they start with almost no organization, relying only on informal, decentralized, and non-hierarchical organizing mechanisms (Leach, 2005). This is because social movement members seem to have an aversion toward any form of organizing, as organizing structures are seen as not fitting the values of collectives (Clemens, 2005; de Bakker et al., 2017; Weber & King, 2014). Therefore, a related stream of research shows how social movements organize according to their organizational values in a prefigurative way (Reinecke, 2018). This research indicates how organizational members model the new values they protest

for into their organizing structure. Other research has shown that new organizations use organizational forms in their environment as a template; however, they are also in line with their organizational values (Perkmann & Spicer, 2014). In this way, new organizations create an anchor form to work with.

Collective Actio: Simply acting as a collective to raise awareness of climate change

Implications for Research on Movement Participation

Our findings expand this research by showing that organizations use organizing forms in their environment as a template, but without aligning their choice with organizational values (see Figure 3). This process of mimicking an organizing form from those available in the environment was enforced as the collective was striving for an organizing form to be able to act as a collective at all. Mimicking an organizing structure, the collective is familiar with, is a shortcut, as learning and experimenting with new forms is not necessary (Perkmann & Spicer, 2014). Our findings indicate that the process of establishing a hierarchic, bureaucratic structure that enabled the collective to act was a rather unconscious process. Establishing this structure was supposed to circumvent chaos and provide a starting point. This served to gather as many people as possible, to make a buzz, and gain attention to focus on their goal, that is climate action. Therefore, the need to invoke a form of organizing that guides their actions, which might be in contrast to the underlying values, is greater when the process of organizational formation is characterized by urgency rather than rational, structural considerations. We summarize this process of pure willingness to raise awareness of the underlying organizational goal (in our case, climate action), which requires a form of organizing, *collective actio*.

Implications for Research on Organizational Anchor Forms

Previous research suggested that the initially imprinted organizing structure, also called the anchor form, is used to “establish the taken-for-granted, value-infused core of the organization”

(Perkmann & Spicer, 2014, p. 1787). This anchor form serves as the reference point in terms of organizing, and only this initial form is adjusted or modified over time (Perkmann & Spicer, 2014). While this research stresses that the anchor form provides guidance over time, our research points out that the initial form also serves as an anchor, but with a slightly different meaning. The anchor form in our research provides guidance in the emergence of the organization and serves as a starting point in a way that the collective is able to work. However, as the collective has developed, they hoisted up the anchor to sail in another direction in terms of the organizing structure.

Insert Figure 3 about here

Collective Reactio: Fighting against the imprinted organizing structure

Implications for Research on Organizational Imprinting

According to previous research, it is not surprising that collectives initially reproduce organizing structures they are familiar with (Aldrich & Fiol, 1994; Dacin, 1997; Perkmann & Spicer, 2014), even more as they are “conditioned by the institutions that they wish to change” (Martí & Fernandez, 2013, p. 1196; Reinecke, 2018). Our findings are in line with this research, as the collective first mimicked organizing structures with which they are familiar with, even though they wished to change that. Second, the collective developed a hierarchic, bureaucratic structure, even an oligarchy (Michels, 1965, de Backker et al., 2017; Leach, 2005). Moreover, previous research has indicated the difficulty of changing a once imprinted organizing structure due to the inertial force (Marquis & Huang, 2010; Marquis & Tilcsik, 2013). In case organizations are able to change, they nevertheless “maintain a path-dependent trajectory that reproduces the initial commitment to the imprinted anchor form” (Perkmann & Spicer, 2014,

p. 1801; King et al., 2011). Following this, the modification of an imprinted organizing structure is either the result of organizational learning (Ferriani et al., 2012; Marquis & Tilcsik, 2013) or organizational bricolage, which involves the explicit deployment of existing forms (Perkmann & Spicer, 2014). Therefore, our findings are distinct from previous research in showing that the collective was capable of changing the initially imprinted organizing structure by breaking with an existing path. The collective did not change the organizing structure by only adding aspects of other forms for specific challenges or by learning how to improve specific aspects of the anchor form; in contrast, the collective dismantled the initially imprinted anchor form completely (see Figure 3). This involved reversing the before imprinted organizing structure by turning the hierarchy into a heterarchy, by depriving power from so-called figureheads through frequent elections and, at the end, prohibiting representatives of the collective from being full-time members of any political party. This was an important mechanism to break with the existing path, as many of the collective were conditioned by the institution (Martí & Fernandez, 2013; Reinecke, 2018), being members of political parties, and prohibiting these double roles was intended to get rid of this political path, to establish an organizing structure that is different from the imprinted one.

Implications for Research on Organizational Values

Research on organizational values has long been interested in the generation and reproduction of values (Selznick, 1949; Kraatz et al., 2010; Gehman, Treviño, & Garud, 2013). Following this research, organizational values are important as they shape organizational processes (Bourne & Jenkins, 2013). Moreover, initial studies have acknowledged the relationship between organizing structures and organizational values (Greenwood & Hinings, 1988; Hinings et al., 1996), in particular, that organizing structures affect organizational values (Kraatz et al., 2010) and that organizational values are important in the process of forming organizational structures (Perkmann & Spicer, 2014). Our findings contribute to the latter by

showing how the collective was actively fighting for their organizational values, thereby changing the organizing structure. Previous research has shown that organizational values serve as a focusing device or a filter to first establish and later modify the organizational structure. In this regard, organizational values provide the device to select appropriate organizational structures in line with organizational values (Perkmann & Spicer, 2014). Our findings indicate that organizational values are more than just a filter or a focusing device. Only by realizing the importance of organizational values and the gap between imprinted structure and newly articulated values, the collective was able to change the organizing structure (see Figure 3). In that sense, organizational values were the trigger and motivator to break with the existing path, thereby dismantling the existing organizational structure. Accordingly, the collective started a conscious fight for their organizational values and against the imprinted organizing structure. We summarize this process of actively fighting for a new organizing structure that is in line with organizational values as *collective reactio*, which is a counterforce to the hitherto set up organizational structures.

Implications for Research on Emotions in Social Movements

Social movement scholars have studied emotions across a wide range of areas. Therefore, research has emphasized the pivotal role of emotions in the process of “enabling and inhibiting mobilization and providing the resources that sustain commitment” (van Ness & Summers-Effler, 2019, p. 413). In contrast, others have also pointed to the role of emotions in the demobilization stages (van Ness & Summers-Effler, 2019). This is insofar interesting, as tensions within a movement or different divisions oftentimes threaten the survival of movements owing to internal factions loaded with emotional states (Jasper, 2004; Collins, 2004). These internal fights within the movement can absorb emotional energy, which in the end can be the source of failure (van Ness & Summers-Effler, 2019). In contrast, our research indicates that this internal fight with emotional tensions within the movement was a necessary

precondition for the development and continuation of the movement. The emotions related to the organizational structure that were not in line with the organizational values could have led to demobilization, but instead the collective used these emotions to fight for their values. In this sense, used emotional energy forms a collective identity with shared values. Aligning organizing structures with organizational values is in line with research on prefigurative organizing, which has emphasized that in case the collective acts with a higher purpose, this can release enthusiasm and confidence (Reinecke, 2018).

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Figures

Figure 1: Overview of organizing actions on a timeline

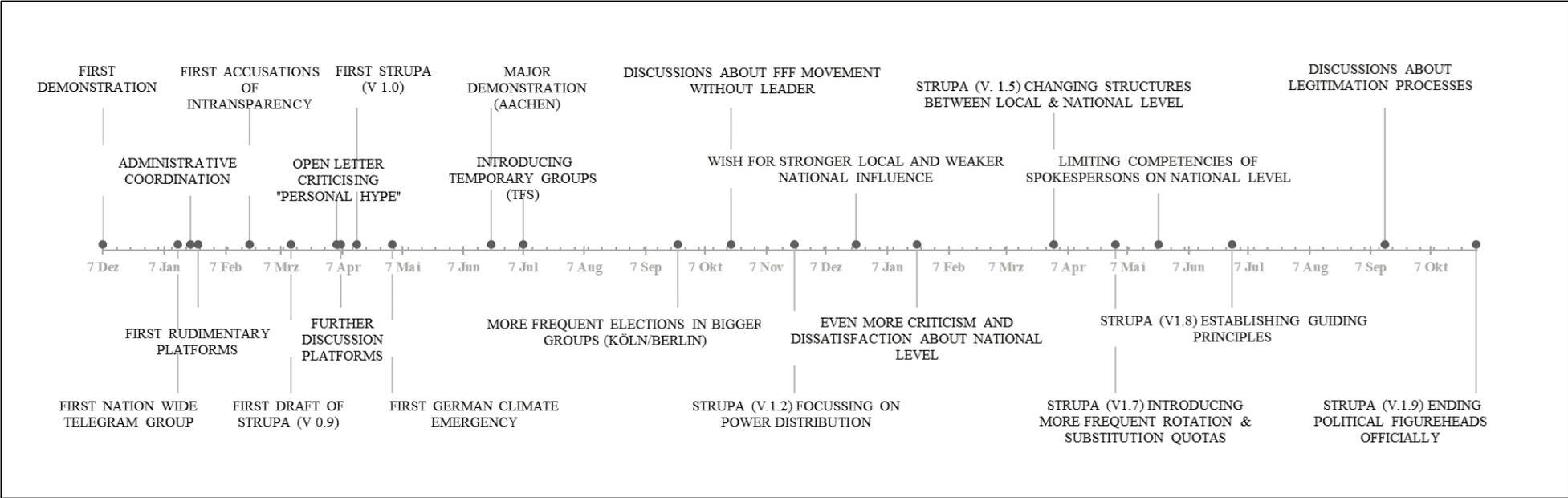


Figure 2: Organigram of FridaysforFuture (similar to FridaysForFuture, 2021a)

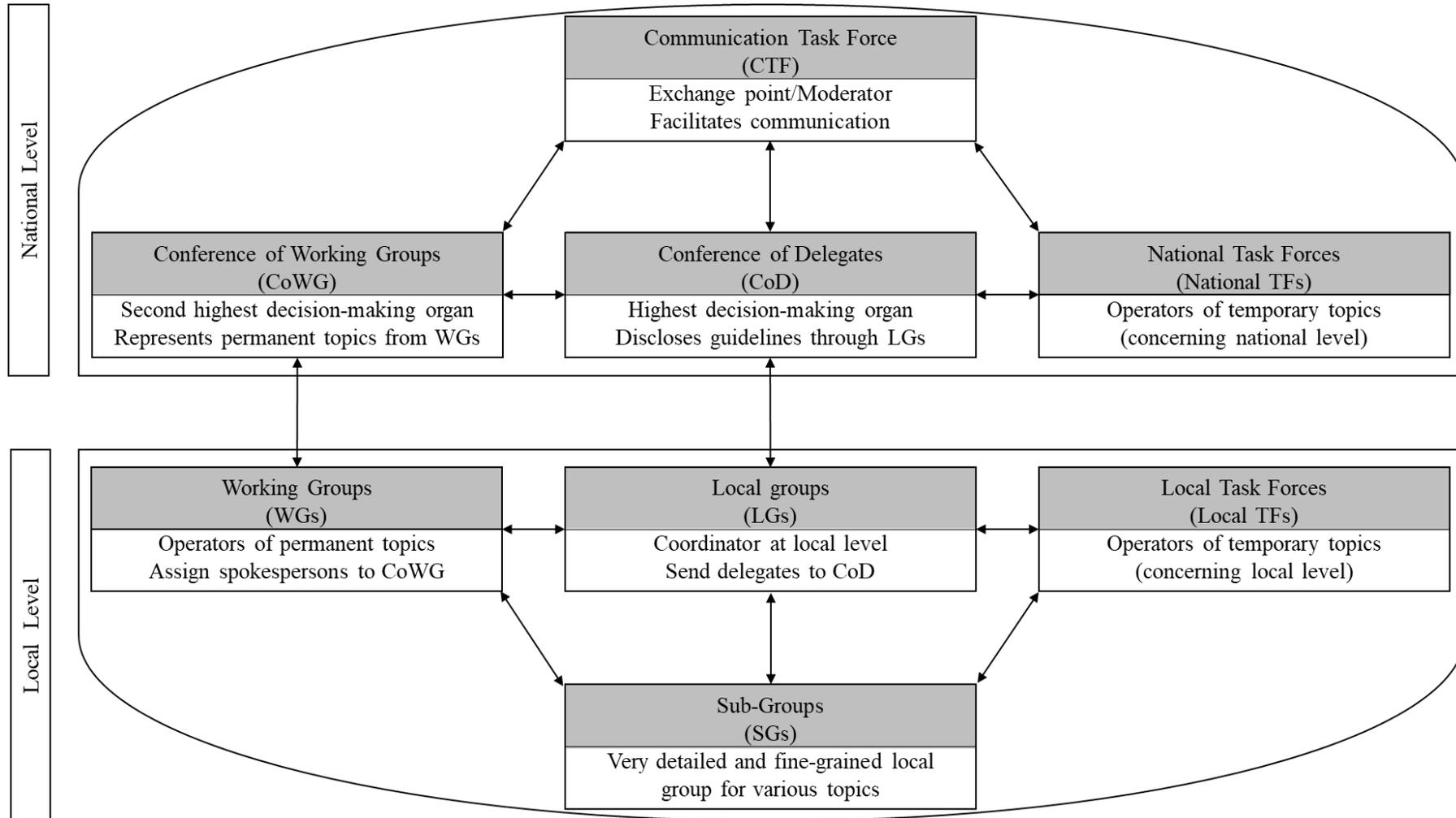
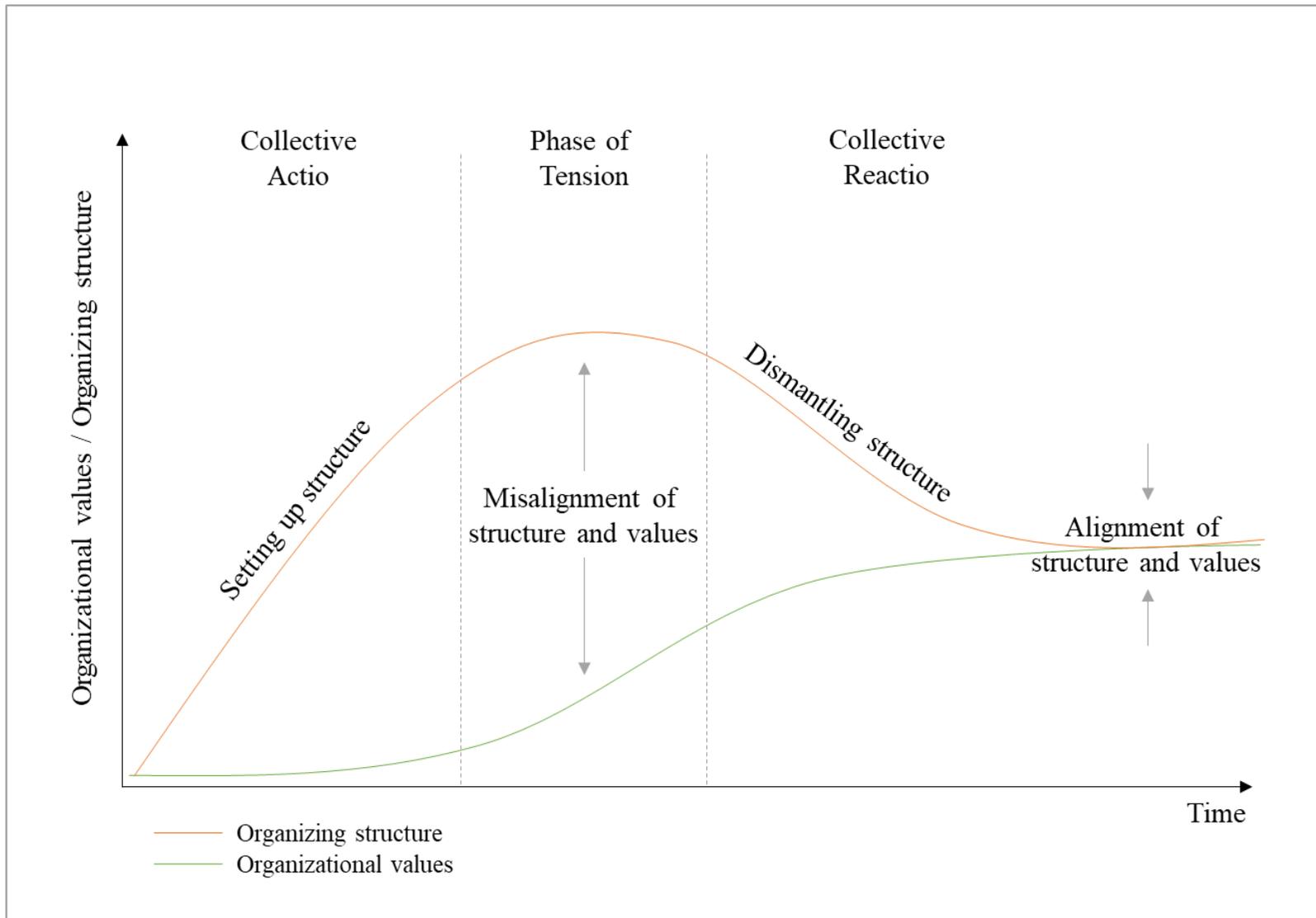


Figure 3: Process model of how organizing structures and organizational values co-evolve over time



Tables

Table 1: Summary of the observation data

Event	Number of units	Field notes	Cities
Team meetings	12 / 35h	30	Greifswald, Berlin, Dortmund, Freiburg
Council meetings	4 / 15h	8	Greifswald, Berlin
Demonstrations	24 / 57h	29	Greifswald, Berlin, Köln, Dortmund, Freiburg, München
Other events	14 / 32h	18	Greifswald, Berlin, Dortmund, Freiburg, München
Digital meetings & lecture	5 / 5h	5	FFF Germany
Total	59 / 144h	90	

Table 2: Summary of the netnography data

Medium	Number of units	Pages A4 PDF
WhatsApp	2 chats	20
Telegram	10 chats	29,218
YouTube	349/ 60,5h	2,188
Instagram	5,422 posts	4,994
Twitter	3,576 twitter media	2,314
Total	9,359 chats/videos/posts	38,734

Table 3: Summary of the formal interview data

Region	FFF member	Function	Minutes of interview
Bad Segeberg	LA	Main-organizer	33:30
	LT	Main-organizer	48:00
Köln	MZ	Organizer	24:55
	FA	Delegate	34:45
	TS	Member	35:25
	AX	Admin	29:55
Kiel	NO	Member	25:21
	EE	Main-organizer	39:22
	VT	Co-founder	39:00
Greifswald	FN	Main-organizer	35:44
	FE	Main-organizer	43:23
	SN	Organizer	27:43
Dortmund	JS	Organizer	40:31
	AX	Admin	62:29
	LA	Admin	43:57
	ME	Admin	36:04
	TE	Main-organizer	61:35
Berlin	LH	Organizer	26:04
	MN	Founder Bot WG	56:37
	JS	Admin	43:54
	PO	Admin	32:51
Freiburg	LA	Admin	47:32
	TL	Founder	33:00
	HN	Main-organizer	29:03
Gelsenkirchen	LE	Admin	29:15
Dresden	MN	Admin	31:02
	CA	Founder	43:26
München	FA	Organizer	40:15
	TA	Admin	49:20
No local group	AY	Founder FFF App WG	51:32
Total	30	7	1175:30

Table 4: Coding scheme for the phase of setting up mechanisms

Data examples from archival data, netnography, and interview data	First-order codes	Second-order codes	Aggregated dimension
<ul style="list-style-type: none"> “[...] first structures looked very loose” (CA, founder Dresden) “[...] it was anarchy and everyone could do something and it wasn’t regulated clearly, what is official and [...] just a mixed crowd” (MN, founder Bot WG) 	No organizational form	Calling for an organizing structure	Phase of setting up mechanisms
<ul style="list-style-type: none"> “None of us had experience how to register a meeting, nor did we have the equipment [...]” (CA, founder Dresden) “The problem is being a verdant activist [...] who hasn’t done almost anything yet” (JS, admin Berlin) 	No experience in organizing		
<ul style="list-style-type: none"> “I just want to restore order” (national level chat log) “[...] with many hands and communication in order to develop collective expertise” (EE, main-organizer Kiel) 	Aspiring an organizing form		
<ul style="list-style-type: none"> “Every LG needs a delegate in order to represent [...]” (FN, main-organizer Greifswald) “The delegate forms the interface between the LG and [...] the national level” (StruPa v.1.0) “StruPas [...] where it is written how we are organized [...] that we vote delegates” (LA, admin Freiburg) “They were created to enable a better look into our processes [...]” (MN, founder Bot WG) 	Voting for delegates		
<ul style="list-style-type: none"> “The national level consists of the delegates, [...] the WGs, [...] and the CTF” (MN, founder Bot WG) “The CoD is the central interface between LGs and the national level” (StruPa v.1.0) 	Separating national and local division		
<ul style="list-style-type: none"> “Most work happens in WGs, the plenum legitimizes” (LA, admin Freiburg) 	Setting up plenary sessions		
<ul style="list-style-type: none"> “[...] the main structure is the plenum [...]” (CA, founder Dresden) 			

Table 5: Coding scheme for the phase of dismantling mechanisms

Data examples from archival data, netnography, and interview data	First-order codes	Second-order codes	Aggregated dimension
<ul style="list-style-type: none"> “[...] the people on top should be electable and delectable and also obliged to give account [...] That [now] is undemocratic!” (Berlin chat log) “Persons who are candidates for or hold a full-time party mandate are no longer allowed to speak publicly in the name of Fridays for Future from the moment of nomination or appointment” (StruPa v.1.9) 	Limiting competencies of „leaders“	Tearing down top-down structures	Phase of dismantling mechanisms
<ul style="list-style-type: none"> “It is important that people and positions, who are tasked to hold speeches or give interviews, are rotated very often” (HN, main-organizer Freiburg) “[...] quicker publishing information and more frequent elections” (TE, main-organizer Dortmund) 	Frequent rotations		
<ul style="list-style-type: none"> “Hierarchies emerge automatically in complex societies [...] it is an eternal fight to limit the concomitant power” (national level chat log) “We can limit hierarchies through an organizational form in which influence of individuals is legitimized and limited” (national level chat log) 	Limiting competencies on the national level		
<ul style="list-style-type: none"> “[...] was so untransparent that they didn't even notice how untransparent they are” (LA, admin Dortmund) “Democratic and transparent decision making is mandatory“ (StruPa v.1.10) 	Increasing transparency		
<ul style="list-style-type: none"> “[...] we have a buddy system, thus stronger LGs [...] instruct smaller LGs and support them” (LA, admin Freiburg) “[...] there is a very small LG in Brandenburg which we [LG Freiburg] support and learn from each other” (LA, admin Freiburg) 	Support between local level groups	Strengthening bottom-up structures	
<ul style="list-style-type: none"> “[...] to always distribute in a fair manner, so other people get a saying” (JS, organizer Dortmund) “New people [...] certainly don't have to do this on their own, but people are there who support with their experience” (TA, admin München) 	Support within local level groups		
<ul style="list-style-type: none"> “Everyone in our local group is a political spokesperson [now]” (TA, admin München) 	Increasing autonomy on a local level		
<ul style="list-style-type: none"> “[...] control the people in the hierarchy from bottom-up” (national level chat log) 	Increasing autonomy on a local level		

Table 6: Coding scheme for the phase of tension and value-orientation

Data examples from archival data, netnography, and interview data	First-order codes	Second-order codes	Aggregated dimension
<ul style="list-style-type: none"> • “She [LX] motivates a lot of people [...] and she practically has abandoned her private life” (national level chat log) • “I don’t see a problem with lacking transparency or excess of competence, disregarding everyone else” (Köln chat log) 	Appreciating “leaders“	Defending hierarchical structures	Phase of tension and value-orientation
<ul style="list-style-type: none"> • “[...] people being more present also being more dominant. That is just logical” (FE, main-organizer Greifswald) • “[...] but there are also hierarchies of how much effort people put in FFF [...]” (TA, admin München) 	Appreciating hierarchical structures		
<ul style="list-style-type: none"> • “[...] they’re in a higher position and tried to push people out of their groups and that escalated in Kiel” (EE, main-organizer Kiel) • “[...] many LGs ‘distrust’ the national level” (TE, main-organizer Dortmund) 	Distrusting “leaders“	Changing perceptions about hierarchical structures and focusing on value-orientation	
<ul style="list-style-type: none"> • “I don’t get it why [...] people always long for hierarchies and bureaucracy. Maybe because we learn it in school, I don’t know” (Berlin chat log) • “Every hierarchy is and always will be a heteronomy which always has to be questioned. A living process” (national level chat log) 	Distrusting hierarchical structures		
<ul style="list-style-type: none"> • “[...] officially we do not have a face” (FE, main-organizer Greifswald) • “Basic democratic, everyone is on an equal footing, a delimitation by ranks is not permitted” (StruPa v.1.2) 	Articulating the importance of basic democracy	Pressuring for less hierarchical structures	
<ul style="list-style-type: none"> • “Because we want to avoid another emergence of such power positions” (FA, delegate Köln) • “We always want different personalities upfront and no personal cult!” (TS, member Köln) • “We are a basic democratic movement [...]” (JS, organizer Dortmund) 	Calling for constituted basic democracy		
<ul style="list-style-type: none"> • “[...] basic democracy, which makes up a grassroots movement like FridaysForFuture, has to be merged with efficient structures in a meaningful way” (StruPa v.1.3) • “A static structure is problematic and in such a movement not feasible [...] static structures lead to hierarchies [...]” (national level chat log) 	Structure must follow idea of basic democracy		

Third Dissertation Paper

Digital orbit of collective action: Switching between inclusive and exclusive modes of ICT in FridaysForFuture

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Abstract

This study analyzes how ICT-based social movements work, coordinate, and use digital technologies. For this approach, we conducted a qualitative study of a vast netroots movement, i.e., a movement that is organized through online media, namely, FridaysForFuture. Our findings reveal that FridaysForFuture's digital infrastructure is based on three spaces of digital interaction, which we refer to as spheres. These spheres can be distinguished as national, local, and external spheres that build on one another. Within each sphere dynamics interfere, facilitating digital coordination. We call such dynamics "open." However, although processes appear open, paradoxically limiting characteristics come to the fore. We refer to them as "closed dynamics." In each sphere, FFF members seek to achieve sphere-specific goals via open dynamics, while solving problems via closed dynamics. Our findings contribute to research on ICT-based coordination, digital mechanisms, and social movement structures by showcasing transformative effects of ICTs on organizing forms.

Keywords: ICT, Digital Mechanisms, Paradoxes, Digital Infrastructure, Social Media, Netroots Movement

Introduction

Collectives, social movements, and social activists are defined as groups that lack institutionalized channels but engage in collective action (Briscoe & Gupta, 2016). By implementing information and communication technologies (ICTs), they can leverage the quick diffusion of tactics (van Laer & van Aelst, 2013), vast operations with loose structures (Bennett, 2003; Massa & O'Mahony, 2021), and open digital networks to foster collective identities (van Aelst & Walgrave, 2002). This paper follows the definition of ICT that “although the term ICT is broader and includes relatively conventional technologies (e.g. telephone) we use this acronym here only with reference to digital technologies” (van de Donk, Loader, Nixon, & Rucht, 2004, p. 20). Traditional research on ICT impacts on collectives emphasizes the importance of ICT effects, such as lowering information costs and broadening the width of organizations (McCarthy & Zald, 1977). Famous movements exemplify ICT usage in collective action, such as the Arab Spring, resulting in 7.48 million tweets from more than 445,000 users in a mere time span of one week (Bruns, Highfield, & Burgess, 2013).

However, researchers have argued about the degree of ICT impacts on social movements, not only about “whether or not ICT usage has impacts on activism [...] [but also if] they represent a more fundamental transformation” (Earl, Hunt, & Garrett, 2014a, p. 2). Hence, traditional research states that *ICT-supported* collectives are merely accelerated and broadened in width, not fundamentally altered (McCarthy & Zald, 1977). However, research on *ICT-based* organizations argues that they fundamentally transform organizational practices and forms (Earl et al., 2014a). Thus, in this study, we attempt to determine how exactly ICT-based social movements work and are structured.

Studies apart from research on social movements, such as open strategy (Dobusch, Dobusch, & Müller-Seitz, 2019), digital networks (Massa & O'Mahony, 2021), and organizational identity (Kozica, Gebhardt, Müller-Seitz, & Kaiser, 2015), revealed processes that are

seemingly counteracting but complement each other in reality. We refer to these studies and their conceptualization for the purpose of ICT-based social movements. Such seemingly counteracting but ultimately complementing processes and tensions are defined as paradoxes (Dobusch et al., 2019; Poole & van de Ven, 1989; Sundaramurthy & Lewis, 2003; Schad, Lewis, Raisch, & Smith, 2016). Dobusch et al. (2019) identified paradoxical characteristics in open strategy processes, revealing that openness is achieved via “closed qualities” (p. 364). The ICT-based partial organization Wikimedia, therefore, created a digital hierarchy where every member has access to view digital protocols. However, they may not equally participate in decision-making processes (Dobusch et al., 2019; Kozica et al., 2015). Similarly, Massa and O’Mahony (2021) scrutinized the hacktivist group Anonymous and revealed paradoxical features in control mechanisms where architectural forms of control replace traditional forms of control. Anonymous welcomes and guides new members through an open source software (Bagozzi & Dholakia, 2006), but channels unskilled members away from critical processes via testing and classification (Massa & O’Mahony, 2021; Dobusch & Schoeneborn, 2015). These paradoxes raise the question of how ICT-based social movements coordinate and organize, and the role that paradoxes play.

To answer the research question on how ICT-based social movements work and are structured, we chose a case study of a prominent netroots movement, a movement organized through online media, addressing the grand challenge of climate action. Van Aelst and Walgrave (2002) stated that “the balance of power and existing political structure is not likely to change” (p. 465). However, within the last three years, a vast social movement has emerged that has drastically pushed political structures to change and advocate climate action, heavily relying on digital means. The chosen case study of FridaysForFuture (FFF) is Loader’s (2008) manifested anticipation, claiming that “we are likely to witness [...] complementary online and

offline social movement activism. A right mixture of new media facilitated conflicts that mediate physical face-to-face and symbolic representations and collective identity” (p. 1931).

During the analysis, three spheres were identified in which actors address specific problems and goals: *national* (i.e., collective body of national organs), *local* (i.e., conglomeration of all local groups), and *external sphere* (or extra-organizational sphere, i.e., public representation of the movement). All the digital spheres within the digital orbit build on one another. FFF newcomers enter the movement from the external sphere. Thus, the first publicly available touching point is social media, followed by joining the local sphere (i.e., city or local groups), and finally the national sphere (i.e., elected national bodies). Entering the movement requires fulfilling certain criteria, which we label *attitudinal*, *attributable*, and *functional criteria*. The fulfillment of the outer sphere criteria is necessary to progress into the inner spheres. Starting with the *attitudinal criterion* in the external sphere, the outermost sphere of the movement, newcomers are drawn and reached out by vast social media presence, being welcomed in digital events or protests. However, they have to oblige to FFF set values and rules for association. This outermost sphere marks the *fight for the FFF association*. Further, addressing the *attributable criterion* in the local sphere, the middle sphere of the movement, members obtain official FFF associations and participation rights in events. However, closed channels and administrative interventions restrict and limit further information solely to productive members. The middle sphere marks the *fight for information*. The innermost sphere with the *functional criterion* is accessible only to officially elected national actors. All national actors gain access to view the most sensible and structural information. However, they only receive restricted editability or structuring rights according to their functions and roles. This innermost sphere marks a *fight for editability or structuring*.

This study contributes to the literature on social movement structures and digital mechanisms in social movements by distinguishing the movement in defined spaces of digital interaction

(Bucher & Langley, 2016), which we labeled as spheres, and allocated goals and problems accordingly. Various digital tools and mechanisms have been showcased in which goals and problems are addressed, shedding light on the non-transformative character of ICT-supported collectives (McCarthy & Zald, 1977; Bruns et al., 2013). This study also contributes to the literature on movement participation and ICT-based coordination, depicting the paradoxical dynamics (Dobusch et al., 2019; Massa & O'Mahony, 2021; Kozica et al., 2015) in each digital sphere, and shedding light on ICT-based collectives' transformative character (Earl & Kimport, 2011; Bennett, 2003; Earl et al., 2014a).

Coordinative and organizing processes using ICTs in collective action

From ICT-absent to ICT-supported and ICT-based forms

Researchers have argued in great debates about ICT impacts on collectives. The arguments are exemplified by various organizing forms that implement ICTs and digital tools.

ICT-absent forms are analyzed by the earliest researchers on social movements when ICTs were absent due to the general digital advancement and reliance on physical contact (Tarde, 1968). An example is the 1958 Kansas sit-ins, where students occupied public spaces in order to disrupt businesses and confront police or hostile whites to break the taboo of interracial dining, using, comparably to today's standards, slow means of collective coordination (Andrews & Biggs, 2006). Organized and famous sit-ins took place between 1960 and 1963 to protest against segregation in libraries, churches, and restaurants. Sit-ins advocate for a nonviolent protest to act collectively and make a difference, many of which are coordinated by student committees and bodies (Chatelain, 2020).

ICT-supported forms studies exemplify the usability and applicability of ICTs, which broaden the width of organizations and collective forms, but ultimately do not fundamentally change them (McCarthy & Zald, 1977). This is also referred to as the "scale change" (Earl et al., 2014a,

p. 27) argument. Much research has been conducted on the Zapatista movement, a Mexican guerrilla movement that attracted global attention to indigenous people in 1994, the “Battle in Seattle,” an anti-WTO mobilization in 1999 that used the Internet to coordinate vast protests, and the Arab Spring in 2010, a series of protests and rebellions across much of the Arab world (Earl et al., 2014a; Earl, Hunt, Garrett, & Dal, 2014b; Garrett, Bimber, de Zúñiga, Heinderyckx, Kelly, & Smith, 2012). The Arab Spring, although “likely to overstate the impact of Facebook and Twitter on these uprisings, it is nonetheless true that protests and unrest in countries from Tunisia to Syria generated a substantial amount of social media activity” (Bruns et al., 2013, p. 1). This big data-sustained movement depicts the effects of social media and ICT with “7.48 million #egypt tweets from more than 445,000 unique users” (Bruns et al., 2013, p. 8) in the digital space of Twitter within a timespan of only one week in late 2011. Social media outlets and other digital tools supported organizational and collective ambitions throughout the last decades in various ways, such as Tweetathons (Pavan, 2017), click-and-give donations, email-bombs, and virtual sit-ins (van Laer & van Aelst, 2013), culture jamming, blogging, Web 2.0 activism, and smart mobs (Loader, 2008), hyperlinked networks, permanent campaigns, and micro- and middle media channels (Bennett, 2003), facilitator of internal democratization (van de Donk et al., 2004), flash activism and mesomobilization (Earl et al., 2014a), and most importantly, social media support (Fahmy & Ibrahim, 2021; Earl et al., 2014b). These numbers provide a glimpse of ICT effects on collective action. However, discussions have primarily focused on protests that were facilitated and accelerated using ICTs and not on coordination processes based on ICT infrastructure (Earl et al., 2014a).

ICT-based forms depict the newest structure and utilize the reduction of costs for organizing to unprecedented lows. They not only expand and accelerate the organizing means but fundamentally alter them (Earl & Kimport, 2011). Criticizing insufficient empirical research, van de Donk et al. (2004) state that “it appears that the research community has particularly

neglected the role of ICTs in the extra-institutional sphere of ‘polities’ in which loosely structured groups and social movements play a prominent role” (p. 2). Earl et al. (2014a) “call for new theorizing because existing models fail to hold – even with modifications” (p. 11) and criticize that “scholars failed to cordon the debate using precise conceptualizations of technology use” (p. 26), “rethinking the organization of protest networks” (Bennett, 2003, p. 10). Not only are ICT-based organizational forms rather new topics of debates, but arguably very little research has shed light on ICT-based social movements. The #MeToo movement has spread from a single tweet to a worldwide online movement, “becoming one of the largest to ever occur on social media” (Fahmy & Ibrahim, 2021, p. 2942). However, although it facilitates mobilization, the #MeToo movement lacks concrete coordination and organizational procedures. Thus, the question remains: How do ICT-based social movements work exactly?

Opportunities and challenges of ICTs in collective action

Theoretical groundwork has been laid on the positive effects, such as quick tactics diffusion (van Laer & van Aelst, 2013) and operability of looser structures (Bennett, 2003) on the one hand, and the negative effects of ICT on the other. Van Laer and van Aelst (2013) argue that weak ties are created, and that rapid ICT-induced growth is often followed by an even faster decline in support. Although information is more accessible than ever, it remains “difficult to differentiate accurate information from fabrication” (Garrett, 2006, p. 22). Further, the ability to coordinate nationally and globally using ICTs does not exclusively benefit social movements but to the same degree, challengers and opponents (Garrett, 2006). Interestingly, ICT may also complicate decision-making processes, when led by an open structure, resulting in “endless meetings” (Polletta, 2002, p. 181), failures, and terminations. The “core social movement problem” (Earl et al., 2014b, p. 14) remains information overload associated with ICT-generated information on the one hand, and slow and low participation rates cultivating “slactivism” (Earl et al., 2014a, p. 25) on the other. These consequences show that “the rapid

development of new applications of – especially-digitally communication technologies constantly challenges the research agenda” (van de Donk et al., 2004, p. 2).

We know about the merits and shortcomings of ICTs in forms of collective action. However, we still lack a fundamental understanding of how they affect the coordination and organization of vast social movements, which depend heavily on digital technologies. Thus, research on other ICT-based organizing forms was used to further investigate such coordinative processes.

Open and closed dynamics as paradoxical mechanisms of ICT-based organizing forms

Because coordination and organizing in ICT-based social movements is a novel field of research, we used research that specifically focuses on other ICT-based organizing forms and borrow from theory-building frameworks of paradoxes (Poole & van de Ven, 1989).

Most studies emphasize ICT characteristics and impacts on ICT-based organizing forms as open, easily accessible, collective, and diffuse (van Laer & van Aelst, 2013; van Aelst & Walgrave, 2002; Bennett, 2003). These effects include the rapid diffusion of tactics (van Laer & van Aelst, 2013), enhancing collective identity (van Aelst & Walgrave, 2002), increasing legitimacy and openness (Dobusch et al., 2019), creating open digital networks to facilitate engagement in activism (Massa & O’Mahony, 2021), and allowing looser structures to operate (Bennett, 2003). However, recent studies revealed that the same ICT-based organizing forms involve seemingly contradictory dynamics, depicting a closed, concentrated, and inaccessible character (Dobusch et al., 2019; Massa & O’Mahony, 2021; Kozica et al., 2015; Dobusch & Schoeneborn, 2015). Thus, the same ICT-based organized form embodies both, open and closed qualities. Such tensions are defined as paradoxes (Kozica et al., 2015; Dobusch et al., 2019; Poole & van de Ven, 1989; Sundaramurthy & Lewis, 2003; Schad et al., 2016). Although paradoxes have been scrutinized in traditional contexts, such as corporate governance through

authority and democracy (Sundaramurthy & Lewis, 2003) and management science (Schad et al., 2016), scholars developed this concept as a theory-building framework (Poole & van de Ven, 1989; Schad et al., 2016) to scrutinize ambiguous topics in organizational and social theory, such as digital networks (Massa & O'Mahony, 2021) and organizational identity (Kozica et al., 2015). We build on this theoretical framework and draw on other ICT-based forms of organizing to analyze ICT-based social movements.

Revealing *open qualities*, Dobusch et al. (2019) scrutinize the strategizing processes of Wikimedia, “that strives for openness as a general principle [...] propagat[ing] an ideal of ‘unrestricted openness’” (p. 349). Wikimedia can be described “as a partial organization” (p. 187), having remunerated employees on the one hand but a vast amount of volunteers on the other (Kozica et al., 2015). Aiming for general openness, Wikimedia consists of about 120,000 volunteers, integrating openness-inducing mechanisms such as highly transparent digital protocols and online workspaces (Kozica et al., 2015), or the so-called “wiki technology, an information technology that enables collaborative authoring” (Dobusch et al., 2019, p. 344). Similarly, Massa and O'Mahony (2021) analyze the hacktivist group Anonymous and identified a participation architecture in this fluid-organizing form (Dobusch & Schoeneborn, 2015). Participation-facilitating dynamics integrate and instruct all newcomers to digital platforms, projects, and current operations without formal membership (Massa & O'Mahony, 2021; Dobusch & Schoeneborn, 2015). Hence, the growing enthusiasm of newcomers was channeled into the organization via explaining culture and practices by experienced, “veteran” (p. 21) members (Massa & O'Mahony, 2021). Informal members leveraged social media and published Wiki protocols and norms to acquire and mobilize new participants. Newcomers forego a process of receiving cultural and practical information, guided by veterans through open source websites (Dobusch & Schoeneborn, 2015), such as the low orbit ion cannon, the

Gigaloader, or open forums, and participate in current events, or “operations” (Massa & O’Mahony, 2021, p. 20).

However, sustaining such vast ICT-based organizing forms demands a complementary dynamic. Dobusch et al. (2019) refer to it as “certain forms of closure [which] may be necessary to achieve desired open qualities” (p. 343) or “*closed qualities*” (p. 364). In the case of Wikimedia, such closing dynamics are specified by the degree to which members are allowed to participate, which is manifested in a number of rules and regulations (Kozica et al., 2015). A digital hierarchy is developed as a means of exclusivity, where the highest ranks have the most decision-making authority and accessibility, while the lowest ranks, or newcomers, have the least participatory rights (Dobusch et al., 2019). This ensures that the openness provided is not used destructively (Kozica et al., 2015). Likewise, Anonymous’ participation architecture switches from normative forms of control to forms of architectural control. Architectural control portrays closing dynamics that range from testing new participants’ skills to shaming newcomers for non-compliance, in order to justify accessibility to critical organizational processes (Massa & O’Mahony, 2021; Dobusch & Schoeneborn, 2015). Classifying new members as “surface members, [with] relegated to mundane tasks” (p. 1060) and therefore limiting digital access, Anonymous established an architecture in which organizational integrity and productivity are secured (Massa & O’Mahony, 2021). Hence, newcomers are channeled away from certain operations, allowing veterans to curate expert tasks without distractions from novices (Massa & O’Mahony, 2021; Dobusch & Schoeneborn, 2015).

Summary of coordinative and organizational procedures in ICT-induced organizing forms

Due to the *absence of ICT* in the earliest movements, the first forms of collective action were organized without any technological means. This marks the beginning of ICT effects on collective forms. Furthermore, traditional research shed light on the applicability and usage of *ICT-supported* organizing forms (McCarthy & Zald, 1977). ICTs have proven to be useful and supportive in accelerating and broadening the width of organizing ambitions, using various digital mechanisms that induce seemingly limitless openness (van Laer & van Aelst, 2013; Loader, 2008; Bennett, 2003). Research on ICT-supported organizing forms denies their transformative character in organizing structures (Earl et al., 2014a). The most recent research has focused on organizing forms that are entirely *based on ICTs*. Because of this recent research, we now know that such limitless openness is not really limitless but bundled with closed qualities (Dobusch et al., 2019; Massa & O'Mahony, 2021). These paradoxical characteristics of enabled openness through closeness or control without controlling underline the “call for new theorizing” (Earl et al., 2014a, p. 26) and the transformative character of ICTs.

Due to the lack of studies of ICT-based social movements, we scrutinize how exactly ICT-based social movements work. Specifically, we want to know which coordinative and organizational processes come to the fore when ICT-based social movements collectively interact.

Further, we know that ICT-induced challenges compromise social movement ambitions and operations. However, we know very little about how ICTs may also solve set challenges and how paradoxical dynamics matter in the solution process.

Case study

After shedding light on the most complex, open, and largest forms of collective action, the case of FFF was chosen. FFF is a netroots social movement of a vast global extent, seeking to fundamentally change social, economic, political, and environmental norms. This vast form of collective action holds the potential to signal the power of change, attract attention, trigger resource (re-)allocation, and simulate further growth while using various digital mechanisms in order to achieve organizing goals (Massa & O'Mahony, 2021; McCarthy & Zald, 1977).

FFF surmounts national and jurisdictional borders, represented by at least one FFF-related event in every single United Nations member state. For the scope of this study, an empirical analysis is conducted in Germany, accounting for the maximum number of FFF-related events in Europe and the second highest worldwide, after the United States. To date, FFF Germany has 679 local groups and 27 national working groups (not accounting for the hundreds and thousands of non-public or temporal groups), which are all digitally intertwined. Figure 1 provides an overview of all local groups in Germany.

Insert Figure 1 about here

Data Collection

This study aims to understand the coordinative processes and effects of ICTs on social movement structures and, therefore, the use of its fine-grained ICT mechanisms. The field was entered with the broad goal of grasping ICT mechanisms and the digital infrastructure, analyzing the entire national landscape of FFF Germany. After the first national assessment, a small number of local cases were selected for further investigation, weighing the advantages

of simplicity and systematic comparison (for a similar approach, see Grodal & O'Mahony, 2017).

To become familiar with our chosen case, the first step of our data collection was to collect publicly available information. These include 21 newspaper articles (71 pages), 95 FFF Wiki articles (545 pages), 12 FFF Pads (FFF protocols; 78 pages), and 14 structural papers (legislation papers; 239 pages).

The second step in data collection in late 2019 was to join publicly available WhatsApp and Telegram groups across Germany. In parallel, the first observations were made in German cities, where publicly available data indicated the most significance. This criterion of indicated significance narrowed the scope of cases to be scrutinized. Most significance could be indicated based on three factors, namely, emergent actions of first local FFF groups, great structural influence on the local and national body of FFF, and unique caesuras, such as unparallel and creative ICT usage, special difficulties, and local terminations.

The first factor showcases local groups with their first FFF-related actions, such as the northern cities of Bad Segeberg, Greifswald, and Kiel. The second depicts influential German cities, that created and heavily influenced national organizing structures, such as Berlin, Köln, München, and Dortmund. The third indicates unparallel particularities, such as those in Gelsenkirchen, Freiburg, and Dresden.

At least one city, representing one factor, was visited, with interruptions and early terminations owing to the COVID-19 pandemic in 2020, resulting in 144 hours of observations and 90 pages of field notes. Immediate impressions and insights followed a strict same-day rule that helped comprehend the observed phenomena of implementing ICT mechanisms in FFF structures (Gioia, Corley, & Hamilton, 2013; Miettinen, Samra-Fredericks, & Yanow, 2009). Additionally, these observations and visits helped us build a trusting relationship with FFF

members (Kirk & Miller, 1986), which was necessary in order to gain access to more online groups and meetings. Table 1 provides an overview of the observational data.

Insert Table 1 about here

Although rigorously using traditional “triangulation measures to ground the emergent theory” (Eisenhardt, 1989, p. 536), a novel tool for data collection and analysis has been the focus of this study, that is, netnography or the “new social media research” (Kozinets, 2015, p. 3). It is a major tool in data acquisition that addresses digital communication exchanges, practices, and interaction styles (Kozinets, 2015). It implements the “native [...] born in the Web” (Kozinets, 2015, p. 245) method, where 38,734 pages of digital data have been gathered over a time span of 3 years (from December 2018 to November 2021). Various social media and digital platforms have become data sources, such as Telegram, WhatsApp, Twitter, Instagram, and YouTube, depicting a scale of data collection and analysis “that would have been unimaginable just a few years ago” (Garrett et al., 2012, p. 223). Table 2 provides an overview of the netnography data.

Insert Table 2 about here

The final step involves conducting semi-structured interviews (Gioia et al., 2013). Interviews were held with founding members of local or even national groups, main-organizers (being a critical part of every event or demonstration), organizers (being part of the core team), administrators or admins (organizers monitoring platform communication), delegates (local

group representatives at the national level), spokespersons of working groups (WGs), regular members (participating in meetings and events), and demonstrators (participating occasionally or at least once). Each function depicts its own reasons and problems in implementing ICTs. 30 formal interviews were held, with an average of 40 minutes each and a duration of 20–80 minutes, resulting in 582 pages of final transcripts. The supplementary 28 informal interviews covered 28 pages. Each participant will be mentioned by randomly chosen initials when their quotes and references are used, due to the sensible political topic of our researched movement and anonymity request (for a similar approach of “safe narrative,” see Lawrence, 2017, p. 1777). Table 3 provides an overview of our interviewees, their functions, and local groups.

Insert Table 3 about here

Finally, we iteratively repeated step three, netnography, with updates from new chats, logs, and comments with steps four and two, interviews, and observations, in order to narrow and shift the focus throughout the data collection process (for a similar field-entering approach, see Grodal & O’Mahony, 2017).

Data analysis

Not only did ICTs change organizing structures, but in order to analyze such changes, the methods of collecting data and analytic techniques were also changed (Garrett et al., 2012). “Social movement and the contribution of the Internet [...] are in full evolution hard to quantify” (van Aelst & Walgrave, 2002, p. 487). In order to fully grasp the “difficult to observe [...] moving target” (van de Donk et al., 2004, p. 2), the data analysis progressed in two cycles, resulting in a structural view and a procedural view on the collective action in FFF.

As a first step, digital spheres or socio-virtual “spaces – bounded social settings, characterized by social, physical, temporal, and symbolical boundaries” (Bucher & Langley, 2016, p. 594) could be identified. Bucher & Langley (2016) define spaces as “loci for bounded interaction” (p. 597), a bounded setting in which modes of interaction can be set apart from other activities. We refer to such bounded settings or spaces as spheres. FFF’s digital spheres or bounded settings in a digital infrastructure, are categorized as national, local, and external spheres, using the FFF language (Miettinen et al., 2009). As a second step, goals, unique sets of problems, and approaches of FFF members are allocated and categorized according to each sphere. All spheres build on one another and form a digital orbit, depicting the entire movement as a digital means. We label this depiction of goals and problems across three spheres that build on one another as a structural view on the digital orbit. Table 4 provides our data structure and empirical evidence.

Insert Table 4 about here

The second cycle of data analysis starts as a first step by identifying the digital mechanisms of each FFF sphere used for coordination. When analyzing the ICT-organized coordination in every sphere, one major finding has crystalized. ICTs have mainly been used in two complementary modes, namely, inclusive and exclusive mode. The *inclusive modes* of ICTs focus on achieving the sphere-specific *goal*, derived from the first data analysis cycle, while the *exclusive modes* of ICTs try to mitigate and solve the *problem* identified in the first cycle of data analysis. Thus, three distinct criteria could be identified to characterize the coordinative interplay of inclusive and exclusive modes in each sphere (see our data structure and empirical evidence in Tables 5, 6, and 7):

- *Attitudinal criterion* in the external sphere: All entrants are reached via manifold social media outlets. However, only conforming people according to FFF values, rules, or guidelines may participate.
- *Attributable criterion* in the local sphere: All local groups and members of local groups may officially participate in FFF events. However, further information is restricted to productive members only.
- *Functional criterion* in the national sphere: All national actors have access to view sensible nationwide information. However, only legitimized actors receive certain editability or structuring rights.

Insert Tables 5, 6, and 7 about here

The dominant digital mechanism of the external sphere is *social media* utilization, drawing as much attention as possible on the one hand (inclusive mode), and disassociating with non-conforming people according to FFF culture and rules (exclusive mode) on the other. Following this *attitudinal* criterion, entrants become officially associated with FFF and involved in official statistics and reports as well as displayed on official FFF social media accounts. This marks the first and outermost criterion for the digital orbit to become a member.

The dominant digital mechanism of the local sphere is *messengers*, distinguished in open channels, providing short-term goal-oriented information, where anyone may participate (inclusive mode) and restricted channels, providing long-term goal-oriented information, where chosen (productive) people receive further and more crucial information (exclusive mode). This *attributable* criterion allows FFF-associated members to further access more

sensible information when proven to be trustworthy and productive. This marks the second and middle criterion of the digital orbit, given the first criterion, attitudinal, to be fulfilled.

The last dominant digital mechanism of the most protected and restricted sphere, the national sphere, is the *FFF digital infrastructure*. Actors within this innermost sphere need to be elected at the local level beforehand, depicting an additional exclusive criterion as a national actor in the first place. The digital infrastructure provides access to a common digital tree trunk where most information, FFF legislative processes, and rules are displayed to any national actor (inclusive mode), while simultaneously branching digital groups in their editability rights (exclusive mode). This *functional criterion* allows each actor to view all centralized information, albeit only decentralized editability is enabled within specific digital branches. Examples are delegates' editability on delegate platforms and the working groups' editability on working group platforms. The functional criterion marks the last and innermost criterion of the digital orbit, after the first (attitudinal) and second (attributable) criteria are fulfilled.

Finally, the aggregated dimension of the first data analysis cycle emphasizes a *structural depiction* of the phenomenon with distinct goals and problems that are addressed by FFF members. ICT inclusive modes aim to achieve sphere-specific goals, whereas its exclusive modes seek to solve sphere-specific problems. Thus, the second cycle of data analysis emphasizes the *procedural depiction* with intertwined inclusive and exclusive modes of ICT and distinct coordinative criteria.

Results

This study is categorized into three digital spheres that form a digital orbit of collective action. Each sphere is characterized by its members, goals, and problems, depicting its *position* within the digital orbit of FFF from a structural viewpoint. Building on this position, inclusive and exclusive modes are described as a second step. Inclusive modes of ICT aim at the sphere-specific goals, while exclusive modes seek to solve sphere-specific problems, depicting the *dynamics* of the digital orbit from a procedural viewpoint. The criteria for the outer spheres are prerequisites for the inner spheres. Thus, digital spheres build on one another, with the innermost national sphere requiring the fulfillment of both, criteria of the local (attributable) and external sphere (attitudinal). Figure 2 shows an overview of the structural digital orbit.

Insert Figure 2 about here

External sphere

Position in the digital orbit

The FFF movement refers to the outermost sphere as “external” [TE, admin Dortmund] but it should be understood rather as an extra-organizational sphere. This sphere is the FFF movement in the broad sense and contains no sensible or critical information.

Entrants of the external sphere are interested *protesters* and *FFF partners* who are mobilized for certain events.

The *goal* within this digital sphere is to “*reach the most people*” [SN, organizer Greifswald], via “networking within our alliance” [FA, organizer Köln] and maintaining organizational integrity “to not be captured by [German parties]” [TE, admin Dortmund].

Problems arise when hostile entrants within this sphere *attack*, infiltrate, hijack, and propagate their own, mostly highly politicizing, agenda, resulting in the outcry:

“[...] there were problems with hostilities [...]. We do not want any political flags” [FA, organizer München]!

Although no critical structural information (as in the national sphere) nor personal or group - specific information (as in the local sphere) are shared within the external sphere, the FFF movement still called for protection, this time concerning the reputation because “again and again [...] groups were hijacked” [AX, admin Köln] and “FFF was attempted to be defamed” [AX, admin Dortmund]:

“We need to consider that FFF demonstrations have a really good reputation, a reputation so parents likely let their children join” [national level chat log].

Strict rules in the otherwise open external sphere arose from an incident in 2019 when first safety mechanisms and digital infrastructures emerged. Intruders belonging to an extremist political party managed to pass through the external into the local sphere, wreaking havoc along the intrusion and being responsible for the dissolution of a local group in Gelsenkirchen.

Hostile extremist political members participated in group activities and acquired an increasing number of members with similar ideologies, which finally resulted in:

“a three-quarters majority, initiating a new delegate election and only put their people into office” [AX, admin Dortmund].

Hostile political members used digital platforms of FFF Gelsenkirchen in order to elect sympathizers into offices (such as admins), which, in turn, had the ability to exclude any member from the official digital FFF Gelsenkirchen group. Thus, the newly hijacked group with new admins expelled non-conforming members. As a consequence, this led to the “delegitimization at the federal level and founding anew” [AX, admin Dortmund]. Thus, the former Gelsenkirchen local group FFF Gelsenkirchen was officially delegitimized and a new group had to be founded, resulting in “two local groups in Gelsenkirchen, one consisting of [hostiles] and the other of ‘decent people’” [LE, admin Gelsenkirchen]. After bot attacks, spammers, and intrusions, the attitudinal criterion of the external sphere was established to disassociate from non-conforming FFF members, excluding them not only from physical meetings, plenaries, and demonstrations, but also from any FFF-related digital group or channel altogether in order to protect FFF processes and reputations.

Attitudinal dynamics in the external sphere

The *inclusive mode* of this digital sphere “aims at external communication” [TE, admin Dortmund], thus achieving the *goal of reaching the most people*:

“Social media is used for public representation such as YouTube, Facebook, and Twitter” [LH, organizer Berlin].

“To reach more people, we would like to get into the ‘Twitter trends’” [Köln chat log].

The aim of immense media attention is achieved via “hashtags to flood social media” [Berlin chat log]. Hence, as for permanent medial omnipresence, especially social media outlets were focused:

“We have an Instagram account, so we can reach most of the others. Then we have a Twitter account, which is a bit more discussion [...]. And also a Facebook account to, yes, mostly reach older people” [VT, co-founder Kiel].

“Twitter is the main channel, the rest will hopefully have the possibilities to participate in other ways (YouTube, Facebook, Instagram)” [Köln chat log].

“Twitter is good to [...] efficiently reach more people [...] Instagram becomes more and more superficial” [LA, main-organizer Bad Segeberg].

“[...] Twitter and Instagram to advertise demonstrations [...] Twitter is [...] politically utilized” [FE, main-organizer Greifswald].

“[...] to announce we use every social media channel available, reddit, TikTok” [LT, main-organizer Berlin].

Each social media outlet is specifically used for targeting potential new members, “having various [specialized] functions which are fulfilled by certain accounts” [LT, main-organizer Berlin], “tweetstorms” [Berlin chat log], and “new online-events: [...] first online strikes [...] via Zoom, [...] YouTube, [...] and a livestream on Instagram [...] as well as the new app [...] AppForFuture” [Freiburg chat log]. Each outlet is used efficiently figuring out that “Instagram and Facebook algorithm supports posts with many interactions significantly more [...] when networked together [...] in which members can quickly like, comment, share, and thus push posts even more so” [Freiburg chat log].

The *exclusive mode* grapples with the *problem of digital attacks* and highly emphasizes value-driven ground rules, legislated in the national sphere, as well as published recommendations such as do’s and dont’s:

“What is this group for? You can: Ask questions and answer them [...], organize bigger and smaller groups [...], find corona-compliant sleeping places [...] you should not: Share faces, names, or personal data; insider or scene specific information, [...] spam; off-topic messages; (lengthy) private conversations” [Köln chat log].

These rules educate entrants in cautious behavior within this digital sphere such as “not to share the link via social media [...] only doing that with info groups so that bots do not bother” [Dortmund chat log] and warn them about imminent attacks and distress:

“Attention: Currently many botnets are joining FFF groups” [Köln chat log]!

Entrants who disregard FFF rules are digitally disassociated. Digital disassociation occurs in the form of excluding people from digital occasions, such as digital protests, deleting comments on public outlets, and blocking accounts on social media:

“Everybody deserves a second chance, that is why I let him talk, however he is a right-winged troublemaker” [Berlin chat log].

“We do not want anything to do with them” [FE, main-organizer Greifswald].

The interplay of dynamics of the external sphere describes the outermost criterion upon which inclusive and exclusive modes interfere, that is, the attitudinal criterion. Every entrant is reached through multiple social media outlets. Social media is used as a “tool of mobilization” [FA, organizer Köln]. However, FFF association, and therefore official participation, is restricted in accordance with the attitudinal criterion, hence conforming with FFF values. Non-conforming entrants, mostly “conspiracy theorists or right-winged people” [MZ, organizer Köln], are disassociated from FFF events (offline or online):

“[...] they have repeatedly failed to comply” [FA, organizer München].

“[...] we clearly distance from them” [LA, admin Dortmund].

Thus, only conforming entrants receive an FFF association. The more entrants conform with FFF values and rules, the more events they are invited to and the more they are able to participate in, marking the *fight for FFF association* in this external sphere.

Local sphere

Position in the digital orbit

The members of the local sphere can be described as the *conglomeration of all local groups*, thus every city, district, or county with a “FFF” prefix, such as FFF Köln or FFF Berlin (see Figure 1 for an overview). This sphere contains important information about local organizers, elections, results on votes, protocols, and meetings, albeit being less critical than structural processes at the national level.

The *goal* of this digital sphere is to *distribute sufficient information* and encourage members to introduce new ideas. This is particularly expressed in the “wish for a prolific discussion culture” [national level chat log]. FFF local members seek “faster publication of information” [TE, admin Dortmund], “needing something to continuously clarify topics” [VT, co-founder Kiel], because “that is the only way we can work productively” [Berlin chat log]. This sphere is characterized by searching for productive members who can manage and distribute vast amounts of information.

Problems arise when idle or *unproductive* members join and slow down the processes. Many local groups are concerned about productivity because only “three people know what they do and the rest just slacks around” [FN, main-organizer Greifswald]. Unproductivity is a main reason for frustration at the local level with a call “to all productive people: [...] to not let such [slacking] people paralyze the discussions that are very necessary [...]” and openly ask “why do I only need one or two provocateurs to ‘de-rail’ the whole forum?” ... What does that mean

for FFF when people spam this chat climate with counter-productive thoughts” [national level chat log]?

Local members need to at least fulfill the criterion from the external sphere, attitudinal criterion (conforming to FFF values) in order to become a local member in an open group. Entrants from the external sphere have little to no access to information on local organizers and local procedures. Furthermore, more important local information is distributed to selected persons who have proven to be productive and trustworthy via access to restricted local groups:

“You have to [...] at least visit two plenaries to get into a local group” [MZ, organizer Köln].

“Truly interested participants are invited to a real discussion group” [JS, admin Berlin].

Attributable dynamics in the local sphere

The inclusive dynamics of the local sphere address the *goal of distributing relevant information* through a manifold portfolio of *messengers*, such as WhatsApp, a very quick communicative mean which is also “very spontaneous” [LA, admin Dortmund]. It allows a high degree of flexibility, and especially smaller groups “run organizational stuff mostly via WhatsApp” [LT, main-organizer Bad Segeberg] or as LA, admin Freiburg, recalls:

“WhatsApp [...] played a big part in the beginning of FFF [...] actually it contributed heavily to [first] steps of mobilization.”

Signal, another messenger that quickly shares information, is deemed an important and safe communicative groundwork. It “is basically the secret working medium” [LA, admin Dortmund]. Further messengers, such as Telegram, are used “for everything involving long-term [...]” [AX, admin Dortmund], “[...] allies and WGs” [FA, organizer Köln].

Open channels, which are programmed to provide short-term goal-oriented information, are mostly “as low a threshold as possible” [AX, admin Köln]. Such open channels are accessible to any FFF conforming member with the information displayed to anybody who joins:

“Can you, on the one hand, switch the group to public, and on the other make the chat history visible to new members” [Kiel chat log]?

Such open channels, as in WhatsApp, Signal, or Telegram, are free to join, and entrants have certain rights regarding posting texts, pictures, or links, participating in dialogue and discussions.

Exclusive dynamics seek to solve the *problem of increasing unproductivity*. They are characterized as closed for non-organizing members or “groups where no one, except for admins, is able to message” [MZ, organizer Köln]. These restricted groups, such as the core-organizational group or the local WGs, restrict information to shield from unproductive or disruptive members:

“[...] a safety mechanism [...] to establish closed groups” [FA, organizer München].

“[...] establish an entry group where they are filtered out” [FN, main-organizer Greifswald].

Even open WhatsApp, Signal, and Telegram channels incorporate exclusive mechanisms mostly in the form of admin interventions when participants strayed from productive discussions to meaningless distractions:

“Hey, is not this group supposed to address organizational stuff? How about not discussing this in a group with 570 members (of which approximately 560 are in to receive ORGANIZATIONAL STUFF) [...] [Berlin chat log]?”

“I think this group should be used for organizational, strategizing, and information purposes and NOT for spam and bilateral talks which are not topics of FFF” [Köln chat log].

“This is not a framework for exchange but an organizational [tool] to clarify [...]” [Köln chat log].

“This makes this chat, which is intended for people to organize themselves, discuss concrete FFF actions, and inform about ‘breaking’ events, quite unusable. It almost seems to me that that is exactly what [they are] aiming for” [Berlin chat log].

“Please just kick these trolls or at least ignore them. The spam is annoying. There are other groups for discussions [...] your message is more spam than useful considering this is an info-group with almost 600 members” [Berlin chat log].

“[...] kick people who are constantly discussing trivial things that do not bring any progress [...] the admins (as the arbitration body) have to decide that” [national level chat log].

When admins first reacted on the call for “automatic clean ups” [FFF Germany chat log], thus kicking and banning people according to “blacklists/whitelists” [FFF Germany chat log], they did so in a careful and timid manner:

“After a few more people expressed their dissatisfaction with the information content of the chat, I ask [...] to delete discussion posts and to mute/ban repeat offenders” [FFF Germany chat log].

“ - Here is the thing: I can only ban people who actually send illegal messages. Even if I do not like it myself [...] - No, [...] if people here disrupt the discussion [...] and make it impossible [to function], that is still a problem and you can throw people like that out” [FFF Germany chat log].

“We do not ban proactively, how do you know it is a spammer? [...] And we get 20 mails back by people who were banned unjustly” [FFF Germany chat log].

However, as time went on, the call for “more structured, clearer, and therefore more effective” [FFF Germany chat log] chats became louder, and “[...] all areas became dependent on digital helpers” [Köln chat log]. These digital helpers, hence admins, began to act more resolutely and became more totalitarian:

“THIS DISCUSSION HAS ENDED! You can expect a ban or mute if you try to continue”
[national level chat log].

“ - Warn him but do not ban him. He did not deserve that [...] - What we do or do not is our decision, ok? [...] - Ok” [national level chat log].

Most members agree on the interventive approach of voted and legitimized admins who are entitled to kick and ban people to secure and improve productivity:

“Inform admins of the discussion group to kick people out when they are spamming, trolling, discriminating... If required promote more admins for discussion groups” [Berlin chat log].

“Actually we have a nationwide ban list [...] where banned people try to join in a group are kicked immediately” [JS, admin Berlin].

More information rights are given according to the attributable criterion, thus proving productivity. Interested entrants are “solely publicly invited to our plenaries, but access to our closed groups is gained when attending the plenary session, which emerged from a necessity,” [FA, organizer München] or as MN, founder messenger WG, clarifies:

“Messenger is always a sensitive issue at FFF. But actually, if everyone can just come in, it quickly becomes unproductive.”

This holds true for most local groups, but some have implemented more digitally sophisticated mechanisms to ensure their integrity and productivity, such as programmed bots and commands

in Telegram, or as in the case of FFF Berlin, an entire dummy group. As within other groups, Berlin has publicly provided a group invitation on the official FFF website. However, while most groups have merely shared access to an information group, or an administered open discussion group, FFF Berlin created “a concept with a semi-discussion group [...] [where they] take care that truly interested entrants are invited to a real discussion group, kind of a dummy group with a couple of people from WGs who act as if this group is legitimately active” [JS, admin Berlin]. Interested entrants follow the provided link, seemingly leading to an administered open discussion group. However, this is merely a counterfeit group, where interaction is simulated using programmed bots. Only after a period of time and administrative observation, FFF members invite productive entrants to the real local group. This depicts a hybrid of an administered open and an effectively closed online group.

The interplay of dynamics depicts the ability of every local member to participate in events, discussions, and various online groups within various messengers (given that the attitudinal criterion from the external sphere is already fulfilled). However, local groups restrict this information according to the attributable criterion. Unproductive members receive less or restricted information because of the split between closed and open groups:

“In our local group, there are 5 closed and 5 open groups with 200 entrants each” [CA, main-organizer Dresden].

Local groups further restrict information by banning and kicking people from groups through admin interventions when unproductivity is perceived to be high:

“That is what the admins are for, to enable a prolific discussion” [national level chat log].

In one year, as of 12/2020, FFF groups reported 15,617 admin notifications, of which 2,996 resulted in admin commands (i.e., interventions in the form of warnings, kicks, or bans). Such interventions are centrally protocolled and sent to 179 online groups and 218 admins for update

purposes [Köln chat log]. The split into two channels and extensive admin interventions shield online groups from unproductive derailing. Hence, only productive members receive further information on the events, results, and local processes. Most local groups demand from new members a “fight for trust” [CA, main-organizer Dresden] who in turn *fight for information rights*. The more productive a member is perceived to be, the more information is distributed.

National sphere

Position in the digital orbit

Actors of the innermost sphere, *the national sphere*, consist of *FFF incumbents* from national platforms, depicting the hardest sphere for newcomers to enter. This sphere contains the most sensible structural data. FFF officeholders, representatives, and elected administrators interact as official national incumbents. FFF incumbents, platforms, and structures are documented in the official FFF legislation:

“Every local group is independent and self-administered [...] and determines their own delegates. [...] The conference of the delegates (CoD) is a central interface for the exchange between the local group and the national level [...] The communication task force (CTF) organizes internal communication [...] Every WG has to define its own competencies, which in turn has to be approved by the CoD [...] The conference of working groups (CoWG) is a collective mouthpiece of the WGs. Its tasks involve [...] the control of CTF members” [StruPa v.1.0].

The *goal* is to *create a structure* for the entire movement, in the form of a common concentrated and “very centralized” [FFF Germany chat log] coordinative organ, and “having everything at one place to gather ideas” [LA, admin Dortmund]. Each of this sphere’s actor has an equal right to view sensible information from this coordinative digital organ after conforming with FFF values in the external sphere, proven to be productive in the local sphere, and being elected

in the national sphere. The final results and excerpts of the common digital organ, the digital infrastructure of FFF, are documented in legislative papers, stating FFF norms and rules such as “public lists with all WGs, delegates, and local groups” (StruPa v.0.9), the frequency of actors to “give account and in-depth reports” (StruPa v.1.2), a public communication tool “[...] to provide a public telegram channel” (StruPa v.1.5), and the common belief system that “all members are treated equally and [...] act basic democratically” (StruPa v.1.8). This sphere is characterized by a search for legitimized incumbents and constitutes common rules for every other sphere.

Problems concern the *legitimation* of editability or structuring rights. Such critical rights are cautiously given for a defined scope of action:

“[...] at the national level, you have to get the [...] approval [...] you always have a self-formulated scope for action that you have to legitimize” [AX, admin Dortmund].

„Later, it was just like that, you had to write a legitimation paper [...] to define the tasks and the scope of action [...] and then the delegates vote” [MN, founder messenger WG].

Because national actors are FFF officeholders who are already elected, collective contributions are arguably already impaired when considering local members and external entrants. National actors need to fulfill the criteria from the local sphere, thus the attributable criterion (i.e., proving to be productive), and the external sphere, thus the attitudinal criterion (i.e., conforming with FFF values), in order to be considered for election as CA, main-organizer Dresden, describes:

“You need to be there for a certain amount of time and complete the tasks and move the group forward.”

Members of the local sphere and entrants from the external sphere have no access to the most sensible processes without elected positions. Such sensible processes involve digital

contributions in the form of nationwide Pads, a tool to collectively and simultaneously work on a digital mean, as FA, organizer Köln, ensures:

“There are no Pads in public groups because too many [...] could (re-)write it” [FA, organizer Köln].

Functional dynamics in the national sphere

Inclusive dynamics within the national sphere pursue the *goal of a centralized coordinative digital infrastructure*. Many processes are transferred into one digital stream, allowing every national actor to view any procedure within the two major ICTs:

“We needed to create a safe platform, which unites everything and provides cool features [...] as well as safety” [national level chat log].

“With Slack [having] firstly various channels, secondly, threads and single messages to reply, and thirdly transferring votes from pilgrim” [AX, admin Dortmund].

“[...] only the delegates [national actors] have access to the nationwide Pads. They can pass on information there” [CA, main-organizer Dresden].

Hence, Slack and Pad, a tailor-made open source software, form an important coordinative digital tree trunk that “saves all the protocols” [CA, main-organizer Dresden] and merges many digital tasks and processes into one common outlet. This inclusive mode of inspecting all relevant data is further supported with “programmed [...] own FFF clients” [ME, admin Dortmund], allowing a smooth nationwide organization.

Exclusive dynamics address the *problem of legitimation* by limiting editability rights according to the function a national actor bears, as CA, main-organizer Dresden, explains:

“The Pads are often linked to one another via a great deal of nesting, which means there is a main Pad and many Sub-Pads and so on [...] each WG has its own main Pad, each local group has its own main Pad, and so everything is branched out like a tree structure.”

“You can find an overview of all important Pads in our Pad of the Pads (abbreviation PotP)” [FFF Wiki delegates].

Thus, the distribution of editability rights in a common coordinative forum stems from the wish to combat chaos and insufficient structure in a grassroots movement:

“If we want to have meaningful discussions at the federal level, then we have to have something like a discourse/forum/etc. put on where one can talk dedicatedly to various topics in specified categories. Anything else leads to a lot of chaos and very little output. [...] whatever this body may look like, that would be relatively grassroots democratic and still perhaps reasonably structured” [FFF Germany chat log].

The Interplay of dynamics describes the access to “the main Pad” [CA, main-organizer Dresden] or PotP every national actor has. Only specific officeholders can edit these restricted Sub-Pads, such as delegates and spokespersons. “Creating several groups” [LH, organizer Berlin] secures sensible data and restricts editability to legitimated FFF officeholders only. Thus, only certain elected incumbents receive editability or structuring rights from a certain digital branch accordingly. The more national organs an incumbent is elected to, the more editability rights for specific digital branches are received, marking the *fight for editability or structuring rights* in this national sphere.

Discussion

This paper started with an open approach to analyzing the digital landscape of FFF Germany, a vast netroots movement that addresses the grand challenge of climate action. Researchers on

ICT effects on collectives have had large debates about the degree of ICT impacts on processes and structures. Research on ICT-supported organizations argues that ICT impacts induce openness and merely accelerate but do not fundamentally change or transform such organizing forms (Bruns et al., 2013; Bimber, Flanagin, & Stohl, 2005; McCarthy & Zald, 1977). However, collective action and social movement research call for new theorizing and depict unique and unparalleled characteristics and challenges, which traditional research struggles to explain (Earl & Kimport, 2011; Bennett, 2003; van de Donk et al., 2004; Earl et al., 2014a). This study provides two perspectives on ICT-based social movements. First, from a structural perspective, ICTs are instrumentalized to increase the scale and configure the movement, conforming to research on ICT-supported forms of organizing (McCarthy & Zald, 1977; Bruns et al., 2013). Figure 2 depicts the structural perspective. Second, from a procedural perspective, ICTs transform organizing structures in a uniquely paradoxical manner, conforming to research on ICT-based forms of organizing (Earl et al., 2014a; Earl & Kimport, 2011). More recent research has identified paradoxical characteristics in other ICT-based organizations (Dobusch et al., 2019; Massa & O'Mahony, 2021; Kozica et al., 2015). We build on this conceptualization of paradoxical qualities and refer to them as inclusive and exclusive dynamics. Such dynamics interact in each digital sphere, which differs from and builds on one another. The outermost sphere criterion has the lowest threshold and is a prerequisite for inner spheres. Figure 3 shows the procedural perspective, approaching the process movement from the outer spheres toward the inner spheres.

Insert Figure 3 about here

Describing the configuration process: A structural perspective on digital spheres

Implications for research on social movement structures

The findings of this study identify three spheres, i.e., bounded settings in which modes of interactions are set apart from other activities (Bucher & Langley, 2016). We use spaces to differentiate each digital sphere, highlighting the distinctions in interactivity and accessibility. The agglomeration of all spheres results in a digital orbital model, i.e., the digital structure of FFF Germany (see Figure 2). The digital structure reveals the organizational and coordinative characteristics of ICT-based social movements, such as digital hierarchies and defined goals. Digital mechanisms and tools are therefore defined as configurative and scale-inducing (McCarthy & Zald, 1977; Garrett et al., 2012; Bruns et al., 2013). Thus, FFF uses ICTs as instruments to establish a digital structure in a configurative manner, arguably overstating the effect of single digital technologies and social media outlets (Bruns et al., 2013). This structural view on ICT-based social movements conforms to the existing research on ICT-supported forms, viewing ICT impacts as instrumental rather than transformative (McCarthy & Zald, 1977).

In each digital sphere members address goals and challenges and implement (tailor-made) mechanisms to solve them. The *external sphere* (i.e., protesters and interested people) agglomerates maximal *attention*; the *local sphere* (i.e., all local groups) *distributes information*; and the *national sphere* (i.e., conglomeration of all national organs) legislates to create an organizing *structure*. Each sphere has a distinct goal (i.e., attention, information distribution, and structure) and distinct sets of problems (i.e., digital attacks, productivity, and legitimation) addressed differently by FFF members. Studies on ICT-based social movements are largely absent (van de Donk et al., 2004) and in shedding light on ICT-based social

movements, we scrutinized organizing and structural aspects (Earl et al., 2014b). The ICT infrastructure of FFF Germany displays how each digital sphere interacts with others. We label this structure as digital orbit of collective action (see Figure 2).

Implications for research on digital mechanisms in social movements

This study further contributes to the research on digital mechanisms in social movements and sheds light on opportunities, challenges, and particular usage of various digital tools within a legal framework, such as Tweetathons or Tweetstorms (Pavan, 2017), click-and-give-donations (van Laer & van Aelst, 2013), media channels (Bennett, 2003), viral campaigns (Earl et al., 2014b), and flash activism (Earl et al., 2014b), albeit refraining from illegal actions such as hacktivism (Earl et al., 2014a; Massa & O'Mahony, 2021). FFF faces similar problems, confirming the theoretical groundwork of ICT-induced shortcomings. Many digitally created ties are weak and follow a decline in support or slack (van Laer & van Aelst, 2013). "Endless meetings" (Massa & O'Mahony, 2021, p. 2; Polletta, 2002, p. 181) have also occurred in digital meetings and teleconferences, paralyzing the progress of the movement. A digital arm race began when opponents used botnets to infiltrate and disturb FFF processes and discussions (Garrett, 2006), urging the movement to counteract and fight back. While these problems challenge collective forms in a digital context, ICT also countervails and provides various solutions. A decline in support (van Laer & van Aelst, 2013) is specifically addressed in the external sphere, gaining as much (social media) attention as possible (Fahmy & Ibrahim, 2021). Unproductivity is addressed via distinct communicative means and groups (Earl et al., 2014a) and extensive admin interventions. The botnets and spambots of FFF opponents (Garrett, 2006) are fought via tailor-made programs, clients, and FFF bots in various digital channels. Thus, every digital sphere incorporated ICTs as a means of organizing to address goals and problems.

Finally, the *structural view* on the digital orbit describes the *configuration* of the movement and depicts *how the digital structures were built*. Especially in the early stage of the movement, this depicts an instrumental approach toward ICT and conforms with studies arguing for non-transformative ICT effects (McCarthy & Zald, 1977; Bruns et al., 2013). The configuration can be described in three steps:

First, the movement started merely through social media interaction and attention-seeking to reach most people. When new members flooded in and formed online groups, as a second step, messengers and online chats were split and supervised or administered in order to find productive and trustworthy members. In the last and third step, information from all groups was gathered and concentrated in a centralized digitalized infrastructure in order to create an organizing structure and a coordinative national organ (see Figure 2).

Describing the participation process: A procedural perspective on digital spheres

Implications for research on movement participation

In contrast to the structural view, that is, an instrumental approach toward ICT, the procedural view on the digital orbit of collective action demonstrates a transformative character (Earl et al., 2014a). While the structural view depicts the configuration of an ICT-based social movement and forms the basis for further investigation (see Figure 2), the procedural view depicts the ambiguous and transformative processes beyond the configuration (Earl & Kimport, 2011; Bennett, 2003; Earl et al., 2014a). ICT-based social movements embody paradox processes that are by no means trivial and demand closer elaboration (Dobusch et al., 2019; Poole & van de Ven, 1989; Sundaramurthy & Lewis, 2003; Schad et al., 2016). Paradox processes of innermost spheres rely heavily on open source software (Bagozzi & Dholakia, 2006; Dobusch & Schoeneborn, 2015), as opposed to outermost spheres relying mostly on

social media (Fahmy & Ibrahim, 2021). We identified and labelled such paradoxical processes as inclusive and exclusive dynamics, borrowing the conceptualization of open and closed qualities or architectural and normative control from other digital forms of organizing (Dobusch et al., 2019; Massa & O'Mahony, 2021; Kozica et al., 2015). We start by elaborating on the commonalities of inclusive dynamics or open qualities. Then, exclusive dynamics, or closed qualities, are highlighted.

The open qualities of Wikimedia manifested in a common technological platform, the transparent digital protocol and online workspace wiki technology (Kozica et al., 2015; Dobusch et al., 2019). This platform allows collaborative authoring, in which changes and edits are transparent and traceable among its members (Dobusch et al., 2019). Anonymous' participatory norms of control developed a participation architecture, in which newcomers receive cultural and practical information, are educated and guided through open source websites, and finally join projects and operations (Massa & O'Mahony, 2021; Dobusch & Schoeneborn, 2015). FFF's inclusive dynamics resulted in a digital orbit with various spheres where newcomers are guided by experienced members, introduced in various digital platforms, and encouraged to participate in collective action.

As in Wikimedia and Anonymous, potential FFF members also have to fulfil certain criteria, or *closed qualities*, in order to gain an unrestricted amount of participatory rights within the ICT infrastructure. Wikimedia created a digital hierarchy of high and low-ranks, with high-ranks having the most decision-making and participatory rights and low-ranks the least within set rules and regulations (Dobusch et al., 2019; Kozica et al., 2015). Anonymous established a skill-testing system with interior and surface members to limit the accessibility to critical processes and projects. This secured sensible data from irresponsible or unskilled members on the one hand, while allowing expert members to curate tasks without further distractions on the other (Massa & O'Mahony, 2021; Dobusch & Schoeneborn, 2015). FFF's exclusive dynamics

constructed a digital orbit where distrustful unproductive members remain in the vicinity of the movement in order to channel attention at best or completely exclude and disassociate from them at worst.

Implications for research on the coordination of ICT-based social movements

This study also contributes to the analysis of coordination of ICT-based social movements. Exclusive dynamics came to the fore in order to protect sensible data and processes (Garrett, 2006), with inner spheres being more protected than outer spheres. These exclusive dynamics foster inclusive modes so that more trustworthy and productive members could join and sustain the movement (van Laer & van Aelst, 2013). ICTs channeled productive newcomers inwards, and unproductive or disturbing members outwards (Massa & O'Mahony, 2021). Therefore, newcomers forego a certain process of fulfilling criteria in each sphere (Dobusch et al., 2019; Massa & O'Mahony, 2021; Kozica et al., 2015). This process starts with the *attitudinal criterion* in the external sphere, conforming to the FFF culture and rules in order to gain FFF association. It continues with the *attributable criterion* in the local sphere, thus proving productivity and gaining trust in order to get access to further online platforms, groups, and information. The process ends with the *functional criterion* in the national sphere, being elected by other FFF members and gaining certain editability rights to defined structural data and unrestricted inspection rights for all FFF data (see Figure 3). Within this orbital model, exclusive dynamics can be observed, supporting inclusive dynamics that interfere across all spheres in multiple ways. This study not only identified such paradoxical dynamics in an organizing form (Poole & van de Ven, 1989; Sundaramurthy & Lewis, 2003; Dobusch et al., 2019), but also allocated them whenever ICT mechanisms were coordinated for a deeper understanding of organizing dynamics (Schad et al., 2016).

Finally, the *procedural view* on the digital orbit describes the FFF *participation process*, depicting *how people interact* within set digital structures. Especially in the progressing stage of the movement, this depicts the transformative ICT effects and contributes to the call for new theorizing of ICT-based collectives (Earl & Kimport, 2011; Bennett, 2003; Earl et al., 2014a). The participation process can be described in the following three steps:

First, entrants in the external sphere need to conform to FFF values and norms that are legislated in the national sphere, thus fulfilling the attitudinal criterion and fighting for FFF association. In doing so, they receive FFF association and may become official members in the local sphere. Second, members in the local sphere need to prove productivity, thus fulfill the attributable criterion and fight for information rights. In doing so, they receive more group-specific information and may apply for predefined roles as official FFF actors in the national sphere. Third, productive members need to be elected for a certain position (delegate, WG spokesperson, CTF member) in the national sphere, thus fulfill the functional criterion and fight for editability or structuring rights. In doing so, they receive editability and structuring rights according to their position. Editability or structuring rights may result in legislative changes, which are documented in the official FFF legislation papers. Published legislation papers are binding for the entire movement, with set FFF values and norms. Such values and norms oblige new entrants from the external sphere to conform, who, in turn, forego the same participatory process (see Figure 3).

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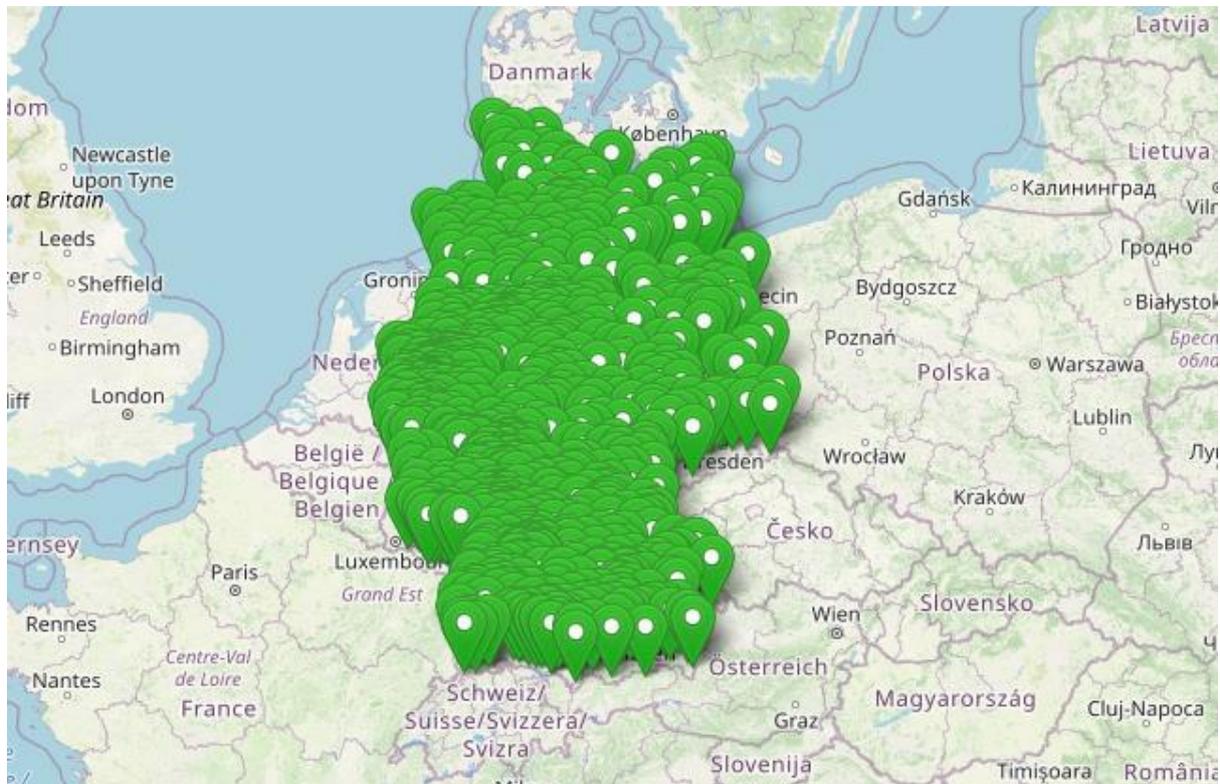
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Figures

Figure 1: Overview of the local group density in Germany



Source: FridaysForFuture (2022). Engagement in local groups. Retrieved from <https://fridaysforfuture.de/regionalgruppen/>. Accessed on 12 January 2022.

Figure 2: Structural perspective on the digital orbit of collective action

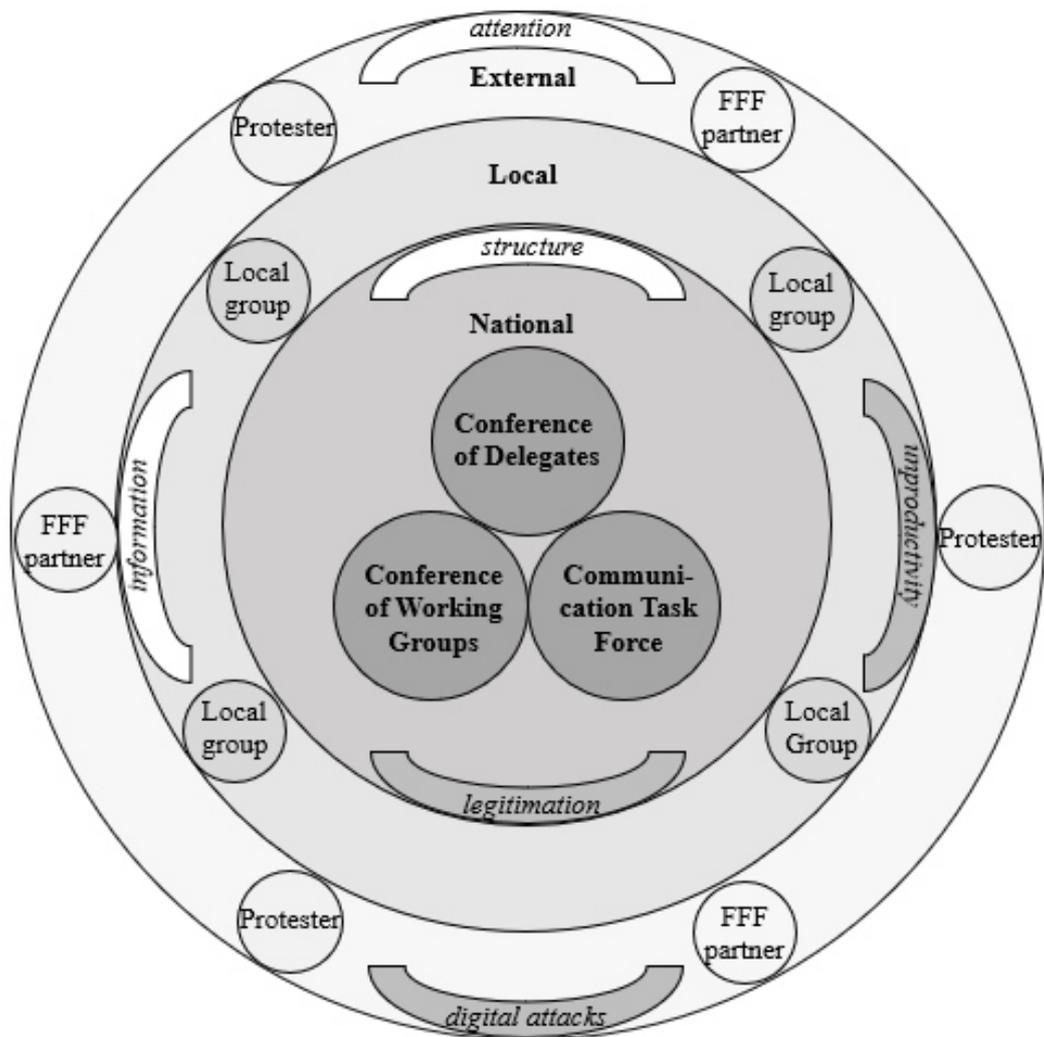
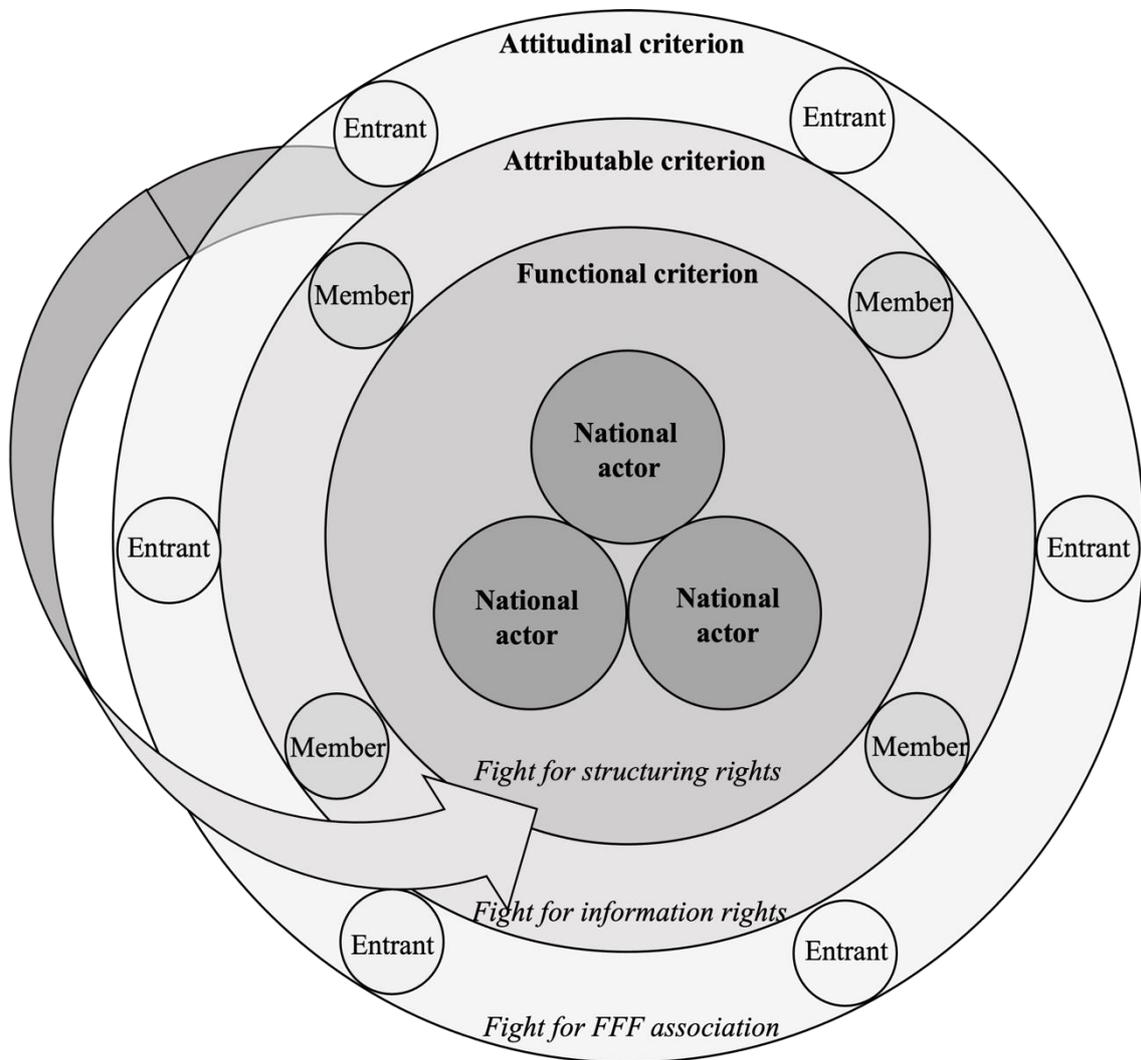


Figure 3: Procedural perspective on the digital orbit of collective action



Tables

Table 1: Summary of the observation data

Event	Number of units	Field notes	Cities
Team meetings	12 / 35h	30	Greifswald, Berlin, Dortmund, Freiburg
Council meetings	4 / 15h	8	Greifswald, Berlin
Demonstrations	24 / 57h	29	Greifswald, Berlin, Köln, Dortmund, Freiburg, München
Other events	14 / 32h	18	Greifswald, Berlin, Dortmund, Freiburg, München
Digital meetings & lecture	5 / 5h	5	FFF Germany
Total	59 / 144h	90	

Table 2: Summary of the netnography data

Medium	Number of units	Pages A4 PDF
WhatsApp	2 chats	20
Telegram	10 chats	29,218
YouTube	349 videos/ 60,5h	2,188
Instagram	5,422 posts	4,994
Twitter	3,576 twitter media	2,314
Total	9,359 chats/videos/posts	38,734

Table 3: Summary of the formal interview data

Region	FFF member	Function	Minutes of interview	Pages A4 PDF
Bad Segeberg	LA	Main-organizer	33:30	13
	LT	Main-organizer	48:00	19
Köln	MZ	Organizer	24:55	12
	FA	Delegate	34:45	16
	TS	Member	35:25	15
	AX	Admin	29:55	14
Kiel	NO	Member	25:21	13
	EE	Main-organizer	39:22	18
	VT	Co-founder	39:00	18
Greifswald	FN	Main-organizer	35:44	18
	FE	Main-organizer	43:23	21
	SN	Organizer	27:43	10
Dortmund	JS	Organizer	40:31	17
	AX	Admin	62:29	23
	LA	Admin	43:57	19
	ME	Admin	36:04	19
	TE	Main-organizer	61:35	36
Berlin	LH	Organizer	26:04	13
	MN	Founder Bot WG	56:37	18
	JS	Admin	43:54	17
	PO	Admin	32:51	16
Freiburg	LA	Admin	47:32	27
	TL	Founder	33:00	20
	HN	Main-organizer	29:03	24
Gelsenkirchen	LE	Admin	29:15	19
Dresden	MN	Admin	31:02	15
	CA	Founder	43:26	22
München	FA	Organizer	40:15	17
	TA	Admin	49:20	25
No local group	AY	Founder FFF App WG	51:32	29
Total	30	7	1175:30	563

Table 4: Data structure and empirical evidence for the structural perspective on the digital orbit model

Data examples from archival data, netnography, and interview data	First-order codes	Second-order codes	Aggregated dimension
<ul style="list-style-type: none"> • “[Protesters on] all [...] accounts: snapchat, YouTube, Instagram, Twitter, Facebook [...]” [Freiburg chat log] • “[...] aiming at external communication” [TE, admin Dortmund] • “We would like to increase our reach on social media [...] to reach even more people” [Freiburg chat log] • “Transmitting the image and an impression of what we’re doing” [LA, main-organizer Bad Segeberg] • “[...] flooding the network to draw attention” [Dresden chat log] • “Again and again [...] groups were raided” [AX, admin Köln] • “Similar group like parties [...] hijack FFF and are possibly dangerous and harmful” [FFF Germany chat log] • “[...] within the first few days to the fact that it was completely hijacked by some idiots. Those then posted agitation, and that meant we had to fight back [...] in a tough fight” [CA, main-organizer Dresden] 	<p>Members</p> <p>Goals</p> <p>Problems</p>	External sphere	Digital orbit of collective action
<ul style="list-style-type: none"> • “[Members] responsible for funding, register demonstrations, post on social media, print flyers” [EE, organizer Kiel] • “[...] maximal information access” [FFF Germany chat log] • “[...] there we receive information and decide how to participate, depending on the current topic” [TA, admin München] • “[...] regarding the information access [...] we try to enact as much transparency as possible” [FA, organizer München] • “In order to plan we dissolved an orga-group which has become quite unproductive [...] In order to get into the group, contact me or come to our meetings: you should be willing to put more effort and work [when joining]” [Berlin chat log] • “The problem is [...] 10 people mainly organize and most of us just participate in co-organization” [LA, admin Freiburg] • “hundreds storming into the group and that of course extremely overwhelmed” [MN, admin Dresden] 	<p>Members</p> <p>Goals</p> <p>Problems</p>	Local sphere	
<ul style="list-style-type: none"> • “Conference of Delegates [CoD], Conference of Working Groups [CoWG], Communication Task Force [CTF]” [FFF website] • “We still want more structure [...] and urge our fellow campaigners to leave WhatsApp” [Köln chat log] • “There [...] one group with all the links to all telegram groups” [Berlin chat log] • “It is super important that every local group fills out the Pad! [...] to help in the nationwide orga-group” [Köln chat log] • “[...] in order to start working one needs to be legitimized” [FA, organizer München] • “You need legitimation for almost everything” [TL, founder Freiburg] 	<p>Members</p> <p>Goals</p> <p>Problems</p>	National sphere	

Table 5: Data structure and empirical evidence for the procedural perspective on the digital orbit model – External sphere

Data examples from archival data, netnography, and interview data	First-order codes	Second-order codes	Aggregated dimension
<ul style="list-style-type: none"> • “[...] large distribution is extremely important for a movement like Fridays for Future” [Berlin chat log] • “[...] common social media platforms such as YouTube, Instagram, Twitter, Facebook” [FA, organizer München] • “Instagram and Twitter mostly [...] during corona we used more YouTube” [AX, admin Köln] 	Reaching out all people	Inclusive dynamics	Attitudinal criterion in external sphere
<ul style="list-style-type: none"> • “Tweetstorms from 12 p.m.” [Dresden chat log] • “Please ensure [...] to really hype up on social media” [Berlin chat log] 	Creating hype		
<ul style="list-style-type: none"> • “[...] when we plan an event we announce it on Instagram, Twitter, and Facebook” [FA, organizer Köln] • “Twitter is an important thing politically [...] Instagram is solely for advertising” [FE, main-organizer Greifswald] • “[...] Facebook and Instagram regarding external communication” [SN, organizer Greifswald] 	Utilizing every social media outlet for specific functionality		
<ul style="list-style-type: none"> • “We [...] have worked out an extensive netiquette as a consequence of the trolling and spam attacks of the last few weeks. [...] we will act according to the rules laid down from now on” [Berlin chat log] • “Problems with [political party], we had rules that no party shall show their flag, they showed it anyways” [TL, founder Freiburg] • “rules were violated [...]” [Berlin chat log] 	Executing behavioural rules from national level	Exclusive dynamics	
<ul style="list-style-type: none"> • “Please spread the above two-part message through all channels (internal concerns of the movement) in all [...] groups and e-mail distribution lists, but if possible not yet via Twitter, Facebook etc.” [Berlin chat log] • “There was a recommendation from the national level that we should avoid plenary meetings for now, because shortly after, the lockdown was announced” [AX, admin Dortmund] 	Recommending do’s and don’t’s		

Table 6: Data structure and empirical evidence for the procedural perspective on the digital orbit – Local sphere

Data examples from archival data, netnography, and interview data	First-order codes	Second-order codes	Aggregated dimension
<ul style="list-style-type: none"> • “WhatsApp and Telegram are used as information channels” [FE, main-organizer Greifswald] • “[...] theoretically, information should be presented objectively” [AY, founder app WG] • “[...] there, information was provided [...] and I could get in touch with other people” [TA, admin München] 	Providing information	Inclusive dynamics	Attributable criterion in local sphere
<ul style="list-style-type: none"> • “That is the creation of communication channels” [AY, founder app WG] • “Slowly, the interactions become productive [...] thanks to open source” [National level chat log] • “[...] so that the communication among each other runs smoothly” [AX, admin Köln] • “[...] with many hands a lot of communication to elaborate expertise collectively” [EE, organizer Kiel] 	Enabling communication		
<ul style="list-style-type: none"> • “We have split the main group into: general discussion, mobility, nutrition, energy, package, communication, social question, society, politics, other” [FFF Germany chat log] • “We should pay attention to the discussions [...] lead to anything productive or end up in hot air” [FFF Germany chat log] • “[...] I think *here* we should limit ourselves to organizational matters and questions among *us*” [Berlin chat log] 	Splitting communication channels according to group specific topics	Exclusive dynamics	
<ul style="list-style-type: none"> • “[...] admin rights or passwords [...] even the account could be stolen” [MN, founder messenger WG] • “[...] to become admin, one need to come to our plenaries, become part of the local group” [CA, main-organizer Dresden] 	Requirement of proving trustworthiness		
<ul style="list-style-type: none"> • “Don’t waste your time with this [...] Simply inform the admins [...] via PM and wait” [FFF Germany chat log] • “Botcreator: the bot bans people automatically, which is saved on an external databank [...] 200 messages per second can be used as a filter criterion” [FFF Germany chat log] 	Administrators & FFF bots banning unproductive members		

Table 7: Data structure and empirical evidence for the procedural perspective on the digital orbit – National sphere

Data examples from archival data, netnography, and interview data	First-order codes	Second-order codes	Aggregated dimension
<ul style="list-style-type: none"> • “Using Slack, we have all our people on a single server, thus Slack is solely used for organization purposes, the organization team internally, externally we don’t use Slack at all” [FA, organizer München] • “Without that FFF Köln would be impossible, that is a pad generator of FFF, a file [...] many people can write at the same time” [FA, organizer Köln] • “During the conference it is important to have access to the Pad. [...] That’s the only way to have your say at the conference” [Berlin chat log] 	Centralizing coordination	Inclusive dynamics	Functional criterion in national sphere
<ul style="list-style-type: none"> • “We examine the information we need, we are legitimized to do so” [JS, admin Berlin] • “Nationwide, everything actually takes place via conference calls [...] with all representatives from all LGs” [CA, main-organizer Dresden] • “Online votes, simply a link forwarded to every one else” [EE, organizer Kiel] 	Overall inspection rights		
<ul style="list-style-type: none"> • “There is no possibility that an unauthorized person can do things on their own” [JS, admin Berlin] • “[...] People responsible for social media are entitled to manage within their scope of action [solely] regarding social media” [AX, admin Dortmund] 	Defining structuring rights according to scope of action/function		
<ul style="list-style-type: none"> • “The WGs, in order to start working, are legitimized through our plenary” [FA, organizer München] • “We [social media WG] are legitimized to be in the Twitter position and of course it can happen any time that we are no longer legitimized [...]” [AX, admin Köln] • “WGs and [...] TFs on the national level have a scope of action, which has to be legitimized. In this scope of action, they are entitled to work autonomously, such as financial groups regarding finances [...]” [AX, admin Dortmund] • “That’s how the CoWG [national organ] emerged, through legitimized WGs” [VT, co-founder Kiel] • “Within WGs no documents are deleted, such basic rules and codes of conduct are technically defined [...] Thus, people get together as a WG on the national level and have to have their structural process legitimized” [AY, founder App WG] 	Legitimizing structuring rights & scope of action	Exclusive dynamics	

Curriculum Vitae

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Submitted Papers

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Kaufmann, L. J., & Danner-Schröder, A.: Collective action as actio et reactio: Aligning organizing structures with organizational values. Under review at *Organization Studies*.

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dass ich die vorgelegte Arbeit selbst angefertigt habe, alle benutzten Hilfsmittel in der Arbeit angegeben und alle wörtlichen und sinngemäßen Entlehnungen deutlich als solche gekennzeichnet sind und dass die Dissertation nicht schon als Prüfungsarbeit für eine staatliche oder eine andere Hochschulprüfung eingereicht wurde;

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Kaiserslautern, 30.08.2022

Leo Juri Kaufmann

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Im Folgenden möchte ich darlegen, in welchem Umfang ich zu den Artikeln, die in Mehrautorenschaft entstanden sind, beigetragen habe. In Anlehnung an internationale Standards (declaration of co-authorship) erfolgt die Einschätzung in vier zentralen Dimensionen:

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- **Planung und Operationalisierung:** Planung der Analysen und Formulierung der methodischen Vorgehensweise, inklusive Wahl der Methode und unabhängige methodologische Entwicklung, sodass erwartet werden kann die wissenschaftlichen Fragen zu beantworten.
- **Durchführung der Analysen:** Grad der Einbindung in die konkrete Untersuchung bzw. Analysen.
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Dabei erfolgt die Einschätzung des geleisteten Anteils auf folgender Skala:

A Leistete einen Beitrag (0-33 Prozent)

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C Leistete die Mehrheit der Arbeit eigenständig (67-100 Prozent)

Für den Artikel „Addressing grand challenges through different forms of organizing: A literature review“ in Mehrautorenschaft mit Anja Danner-Schröder schätze ich meinen Beitrag wie folgt ein:

Konzeption und theoretische Herleitung: B

Planung und Operationalisierung: B

Durchführung der Datenerhebung und Analysen: C

Manuskripterstellung: C

Für den Artikel „Collective action as actio et reactio: Aligning organizing structures with organizational values“ in Mehrautorenschaft mit Anja Danner-Schröder schätze ich meinen Beitrag wie folgt ein:

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