Sustainability Transitions and Strategic Action Fields: A Literature Review and Discussion

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Abstract

With the growing attention to political dimensions of sustainability transitions (STs), researchers have shown interest in theoretical frameworks from policy studies and sociology. A framework that has growing popularity is the theory of strategic action fields (SAF) as developed by Fligstein and McAdam (2011; 2012). This review shows 1) how the integrated and holistic approach of SAF theory can contribute to growing interest in ST research in institutions, power, and agency; and 2) how ST researchers have modified and extended SAF theory. Based on a systematic sample of publications, the study identifies five theoretical clusters of SAF theory in ST research: actor relations and resources; change, emergence, and destabilization of fields; field rules; agency, framing, and coalitions; and strategic action in an interfield matrix. The potential of field theory as an analytical framework for ST research is discussed and critically assessed.

1. Introduction

Leading theoretical frameworks in sustainability transition (ST) studies originally drew heavily on pre-existing frameworks from science and technology studies and innovation studies (e.g., Geels, 2007; Markard and Truffer, 2008). These fields tended to conceptualize the research problem of substantial technological change in terms of systems, functions, and evolutionary processes. As the ST field developed, researchers paid increasing attention to developing a better understanding of agency, power, and strategy in the context of institutional change (e.g., Avelino and Wittmayer, 2016; Fuenfschilling and Truffer, 2014; Geels, 2014; Geels et al., 2016). As this change occurred, meso-level institutional and policy-process theories gained more attention. With this turn to theories in sociology and policy studies, there has been growing interest in the theory of strategic action fields, or "SAFs" (Fligstein and McAdam 2011; 2012; see Köhler et al., 2017).

This study contributes to the literature on sustainability transitions (STs) by exploring both how ST researchers are using SAF theory and how they are developing it. Regarding the first contribution, we show how ST researchers have used SAF theory to provide a holistic and comprehensive framework that is especially relevant for research on the role of agency, strategy, rules, framing, institutional context, and power in ST transitions (e.g., Candido et al. 2018; Canzler et al. 2017; Fuchs and Hinderer 2016a; Köhrsen 2018; Mey and Diesendorf 2018). For example, with respect to the multilevel perspective (Geels 2007), SAF theory draws attention to the unequal positions of actors in an industrial field and the effects of innovations on their power in a field, and it populates the landscape as a set of structural conditions with an interfield matrix that provides strategic opportunities for actors. With respect to institutional approaches that have gained ground in ST research (e.g., Fuenfschilling and Truffer 2014; 2016), SAF theory clarifies how institutional norms and rules

are part of what is at stake in strategic action and how institutional or cultural logics become points of reference in strategic framing.

In addition to describing how SAF theory is relevant to ST research, we also examine how ST researchers have developed modifications of SAF theory and concepts. As ST researchers have applied SAF theory to ST transition research, they have also developed some criticisms, modifications, extensions, and innovations of SAF theory. In other words, SAF theory in the context of ST research is not a standardized package of concepts that can be applied without modification; rather, it is a dynamically changing conceptual framework, and we draw attention to theoretical development rather than just application.

In response to the emerging and growing interest in SAF theory in ST studies, and in order both to describe the conceptual opportunities afforded by SAF theory and to assess critically the value of SAF theory for ST studies, we offer a systematic review of the use and extension of the theory in existing ST studies literature. The review is structured in the following way: first, a brief overview of the history of field theory in general, its application in ST studies, and the research questions; second, the methods used in the systematic literature review; and third, the results, which are divided into two sections. The first section reviews the main conceptual clusters of the theoretical understanding of SAFs in ST research, and the second section draws on the theoretical structure to examine how ST studies that use SAF theory have also modified it. Finally, the potential and future directions of SAF theory as an analytical framework for ST research are reviewed.

2. Background and research interest

The concept of a field originated in the physical sciences and found its way into the social and behavioral sciences through Kurt Lewin's work during the 1930s (Martin, 2003).

Within the social sciences, three main strands of field theory emerged. Bourdieu led the development and application of the concept with a comprehensive framework that drew on political economy, structuralist anthropology, and Weberian sociology (e.g., Bourdieu, 1977; Bourdieu and Wacquant, 1992). Bourdieu developed his concept of social fields over several decades through empirical research on different areas of social life, such as higher education and the housing market. From his perspective, a field is a subset of the broader category of social space that emerges "when a domain of action and authority becomes sufficiently demarcated, autonomized, and monopolized" (Wacquant and Akçaoğlu, 2017: 62). Bourdieu emphasized the idea of a field as a configuration of relations defined by the "distribution of species of power (or capital)" (Bourdieu and Wacquant, 1992: 97).

Since the 1980s, neo-institutionalists designed and developed a second stream of field theories that differed profoundly from Bourdieu's conception. DiMaggio and Powell's (1983) concept of organizational fields initially focused on the explanation of similarity among organizations that share the same institutional environment. Subsequent neo-institutional research focused more on explaining conflicts in fields (Hoffman, 1999; Thornton and Occasio, 1999) and on the understanding of institutional change and agency (DiMaggio, 1988; Garud et al., 2007; Maguire et al., 2004; Wooten and Hoffmann, 2017).

After the turn of the century, Fligstein and McAdam (2011, 2012) introduced SAF theory, which combined elements of previous field theories with aspects of neo-institutional and social movement theory. The authors argued that SAFs are "the fundamental units of collective action in society" (Fligstein and McAdam, 2011: 3). A SAF is defined as "a constructed mesolevel social order in which actors (who can be individual or collective) are attuned to and interact with one another on the basis of shared (which is not to say consensual) understandings about the purposes of the field, relationships to others in the

field (including who has power and why), and the rules governing legitimate action in the field" (Fligstein and McAdam, 2011: 9). This concept borrows heavily from Bourdieu's work, including the idea that fields do not exist independently of the perceptions and definitions of the actors (e.g., Bourdieu and Wacquant, 1992). Compared with the other two approaches, SAF theory directed attention to intentional strategic action and thereby made agency more explicit.

ST researchers have used these three field theory traditions with varying frequency and for different purposes. In the case of Bourdieu, transition researchers generally draw on his work when they are interested in the analysis of habitus, user practices, lifestyles, or sustainable consumption (e.g., Stephenson et al., 2010). However, his theoretical work on fields is used comparatively rarely in ST research (for an exception, see Hess, 2013; 2014a). In contrast, neo-institutionalism has been used widely in some of the central theoretical frameworks like the multi-level perspective (MLP) and the technological innovation systems approach (TIS) to support the analysis of institutions and institutional change (Fuenfschilling and Truffer 2014; Geels, 2004; Wirth et al., 2013). Although attention to institutions is widespread in ST research (e.g., Smink et al., 2015; Markard et al., 2016), the more specific concept of organizational fields is only used as a theoretical framework in a few cases (e.g., Carrosio, 2013; Doblinger and Soppe, 2013). When ST researchers use field theory, they tend to draw on the SAF tradition. This preference does not seem surprising because neo-institutionalist field theory has a more limited scope of application due to its original focus on organizations, and Bourdieu's full approach is comparatively difficult to apply.

In contrast with other field theory traditions, SAF theory has some basic characteristics that make it especially appropriate for the empirical research problems of ST research. It draws attention to dynamic processes in a way that is well suited for the analysis

of change. It is also an actor-oriented framework that puts conflict, power, and strategy at the center of interest. Furthermore, it is flexible in its areas of application. For example, ST researchers have used it to analyze transition processes in cities or regions (Fuchs and Hinderer, 2014; Köhrsen, 2018), transformation processes of economic sectors (Kungl, 2015; Schmid et al., 2017), political decision processes (Hess, 2013; Breslau, 2013), or the influence of social movements (Becker et al., 2016; Neukirch, 2016).

This review focuses on the use of SAF in ST research, and it answers the following research questions: What are the main building blocks of SAF theory that are being used in ST research? How have ST researchers applied SAF theory, and how have they contributed to its development?

3. Method

The review of SAF theory and its applications to ST transitions research focuses on publications where it is the main theoretical framework and where the research is about STs rather than industrial transitions in general. There is a wide range of review genres and methods for conducting them, from the loosely structure review essay to more systematic reviews. For the formal review search process, we followed the general process of the PRISMA method (Tricco et al. 2018). The review proceeded in three phases: 1) searches in ten leading journals in the ST field; 2) a more open search in the literature database Scopus; and 3) a snowball expansion based on bibliographies of articles identified in phases 1 and 2 and additional searches conducted on authors identified as interested in this topic. The searches were conducted in February 2020 and included all publications prior to that date.

For the first phase, we searched the archives of the leading ten journals listed by the Sustainability Transitions Research Network (STRN steering group, 2018: 4). These journals

are Energy Policy, Energy Research and Social Science, Environmental Innovation and Societal Transitions, Global Environmental Change, Journal of Cleaner Production, Renewable and Sustainable Energy Reviews, Research Policy, Sustainability, Technological Forecasting and Social Change, and Technology Analysis and Strategic Management. After first considering a review essay on all three types of field theory, we decided to focus on SAF because it is the main way that the field concept is currently being used in transition studies, and it offers significant theoretical advantages to ST research that have been described above. To identify candidate articles, we used the search strings "Fligstein AND field" and "strategic action field" for these ten journals. (The string "McAdam AND field" returned the same set of relevant results as "Fligstein AND field.") In this first phase we collected a pool of 83 articles, from which selection proceeded. Our selection criteria were as follows: the publication had an empirical focus on ST processes, and it applied SAF theory as its main theoretical framework or used a general field theory approach and cited Fligstein and McAdam. This selection resulted in 14 publications.

The second phase of the search involved an extensive strategy to identify additional articles that did not directly address transition scholars but nevertheless improved the understanding of how SAF theory contributes to the analysis of ST processes. This phase extended our search to work originating from other scientific communities. We tested various search strings in Scopus and came up with a combination of nine search strings that resulted in 1512 abstracts and 818 after removal of duplicates. After removing obvious mismatches (e.g., articles from natural science journals), we read through the titles and abstracts of all remaining articles. Applying the same selection criteria as described above, we identified 10 additional articles. Because the interest was in the intersection of SAF theory and ST research, and because we were looking outside the usual publication venues

of ST researchers, it was not surprising that only a small number of additional articles was identified.

For phase three, based on the bibliographies of the collected articles, further background reading, and targeted additional searches of authors identified in phases 1 and 2, we identified two additional articles that used SAF to analyse ST processes. We also included one additional article that cited Fligstein and engaged with concepts used in SAF but did not explicitly use SAF (Breslau, 2013).

The set of 27 articles shows that research using the SAF framework is being applied to a variety of topics associated with STs. The appendix lists an overview of the reviewed articles and provides a brief topical summary of each.

The analysis of the 27 articles was carried out in two steps. First, we read the theoretical sections carefully and worked out which overarching areas of interest could be identified. Via inductive coding following a modified grounded theory approach (Charmaz 2017), we identified five clusters of theoretical categories that represent the analytical foci of these researchers and that respond to research question 1. In the second step, we read the researchers' case studies and assigned the results to the theoretical categories. We made notes to record the empirical examples used and to record ways in which the ST researchers were modifying or developing SAF theory for use in response to research question 2. In this way we were able to find out to what extent the researchers could help to further develop field theory and to identify potential future directions that are addressed in the discussion section.

4. Results

Results are divided into two main sections that correspond with the two research questions above.

4.1. Central Concepts in SAF Theory as Used in ST Research

In response to the first research question (what are the main building blocks of SAF theory that are being used in ST research?), the analysis of the 27 articles identified five clusters of theoretical categories that reflect the analytical interest of ST researchers who use field theory. Table 1 gives an overview of the five theoretical clusters and the frequency of their appearance in the articles. Although these conceptual areas are similar to those introduced by Fligstein and McAdam in *A Theory of Fields*, they also show how ST scholars have tailored SAF theory to their research interests. For example, many ST researchers are explicitly interested in the significance of field rules, a topic that remains marginal in *A Theory of Fields*. The naming of the five clusters is also based on the research interests of the ST researchers, who place different emphasis on these topics than Fligstein and McAdam. This subsection of the results provides a brief summary of the categories.

Table 1. Five Theoretical Clusters from SAF Theory Used in ST Research

Conceptual categories found in the ST research that uses SAF theory	Frequency (Percentage)
Actor relations and resources	96 percent
Change, emergence, and destabilization	93 percent
Field rules	85 percent
Agency, framing, and coalitions	81 percent
Strategic action in an interfield matrix	78 percent

One topic of interest for most ST scholars using SAF theory is the analysis of power relations of field actors and the resources on which strategic action is based. In this respect, most ST researchers follow the actor typology of Fligstein and McAdam and draw attention

to the central relationship between incumbents and challengers. As the dominant actors of a field, incumbents have greater power, which from a field perspective is understood as the capacity to mobilize diverse types of resources to achieve an actor's goals, and they are expected to be interested in preserving the status quo. In contrast, challengers populate subordinate positions within the field, have less access to critical resources, and have a greater tendency to articulate alternative visions of the field.

A second group of concepts to which ST scholars using SAF theory draw attention is field change. More specifically, they focus on the emergence of new fields as well as the destabilization of existing fields. SAF theory draws on institutional theory to develop a typology of field change and settlement, which includes stability (settled), in crisis (undergoing an episode of contention), or emergence. Change is expected to originate in exogenous processes such as external shocks from other fields (e.g., technological innovation), invasion by outside groups, unintended or intended consequences of state intervention, or large-scale crises such as wars or depressions. Such conditions may, but do not always, provide strategic opportunities for challengers to mobilize and to seek change.

The analysis of rules remains rather marginal in Fligstein and McAdam's work, but it appears in the majority of reviewed articles. Most of the publications that used the idea of rules followed Fligstein and McAdam's analysis of the "rules of the game." The term "rules" encompasses a cluster of concepts such as collective views, norms, values, beliefs, and frames of reference. Rules structure the field and define "what tactics are possible, legitimate, and interpretable for each of the roles in the field" (Fligstein and McAdam, 2011: 4).

A fourth group of concepts prominent in applications of SAF in ST research is the analysis of agency, framing, and coalition building. Some ST researchers take Fligstein and

McAdam's concept of social skill as a starting point (Fligstein, 2001; Fligstein and McAdam 2011), but they put the analytical focus on the strategies of framing and building political coalitions.

A fifth group of concepts involves the interfield matrix. In SAF theory, each field is embedded in a web of subordinate and superordinate fields, some of which are proximate and more relevant to the field under investigation. Fields may also be relatively dependent, independent, or interdependent based on how much routine interaction exists between actors in the different fields. Although the influence of one field over another does not necessarily include the state, the state is given particular attention because of its rule-setting power over non-state fields under its control. ST researchers follow this conceptualization but also pay attention to how actors use the interfield matrix strategically.

4.2. Elaborations and Modifications of SAF Theory in ST Research

In response to the second research question (how have ST researchers applied SAF theory, and how have they contributed to its development?), this section reviews the set of selected articles to describe how ST researchers have built on and modified SAF theory. The section is organised into five subsections based on the theoretical clusters introduced above, and the results are summarized in Table 2. Each section discusses the results in more detail.

Table 2: Theoretical Clusters and Their Use in ST Research

Theoretical Cluster	Understanding in SAF theory	Use, extension, and modification in ST research
Actor relations and resources	Incumbent-challenger relations	Stretching the strict dichotomy of incumbents and challengers, differentiating between the power and posture of agents

	Power depends on access to and the strategic use of resources	Specifying the different types of resources (e.g. economic, social, reputational)
Change, emergence, and destabilization	Different states of fields (emerging, stable, or in crisis)	Focusing on how strategic action contributes to field emergence and the destabilization of existing fields
	Focus on exogenous shocks	Drawing attention to incremental change
Field Rules	Collective views, shared norms, beliefs, frames of reference	Examining the ongoing challenge of achieving and stabilizing field rules
	Field rules are not neutral arbiters of action but stabilize actor relations, role of internal governance units	Identifying the role of new mechanisms for achieving stability of rules (e.g., cultural practices)
Agency, framing, and coalitions	Social skill as the ability to frame visions, create shared identities, mobilize for collective action, and build political coalitions	Differentiating various framing strategies (uniting, opposing, and accommodating)
		Exploring different forms of coalition building (including coalitions across fields)
		Analytically connecting framing strategies and coalition building
Strategic action in an interfield matrix	Focus on the structural relationship among fields (degree of dependence)	Focusing on strategic action that targets opportunities in other fields
		Studying the formation of alliances across fields, including the leveraging of countervailing power

4.2.1 Actor Relations and Resources

ST researchers have used the central concepts of actor relations (the incumbent-challenger relation) and power (the control over resources in a field and the capacity to mobilize those resources to affect outcomes) as introduced in *A Theory of Fields*. However, ST researchers have also identified some areas where improvements are possible, such as developing the incumbent-challenger dichotomy and introducing a more specific understanding of resources.

Beginning with the incumbent-challenger relationship, one contribution has been to develop a more precise understanding of the different types of incumbency: as the posture of actors towards the field's status quo, as the level of resources (capital) of the actors, or as both. For example, Fuchs and Hinderer (2016b) argue that incumbents are not only defined by access to resources and field position but also by their posture towards changes. Other scholars show that because incumbents can bring about fundamental changes, the definition of incumbency should rest more on access to resources (Apajalahti et al., 2018; Köhrsen, 2018). These different uses of the concept of "incumbent" suggest that it is important to differentiate the power of an actor (which in field terms, is the relative control over resources in the field) and the posture toward changes in the field. Schmid et al. (2016) and Canzler et al. (2017) also argue that the posture of the same actor can vary across subfields.

In addition to articulating the power-posture distinction, ST researchers have also drawn attention to divisions within the categories of both incumbents and challengers (that is, distinctions of types of incumbents and challengers). For example, Köhrsen (2018) describes how conflicts occur not only between incumbents and challengers but also within coalitions of either incumbents or challengers. In a similar vein, Blanchet stresses that it is necessary to "go beyond this binary distinction to analyse more in detail the differences in behaviour and the tensions between collective actors within each coalition" (Blanchet, 2015: 252). Becker et al. (2016) also show how different challengers may have competing goals. Along the same lines, Neukirch (2016) differentiates three types of challengers who share a similar goal in the field (opposing an extension of the electricity grid) but vary in motivations, resource endowment, and geographical scale. Heiskanen et al. (2018) also draw attention to the internal divisions of the dichotomy by showing how challengers can come from within an

established organization, such as when an organization establishes an experimental space where rules (e.g., profitability) are temporally suspended.

One of the important strengths of field theory is the conceptualization of power that is anchored in a differentiated analysis of control over resources in a field. A few researchers draw on Bourdieu's conceptualization of different types of capital (e.g. Hess, 2014b; Köhrsen, 2018; see Bourdieu, 1986), and others use a similar categorization of the different types of resources. With respect to economic capital or resources, several researchers discuss the ownership of and access to material resources (Canzler et al., 2017; Mey and Diesendorf, 2018) such as production capacities or infrastructure (Heiskanen et al., 2018; Kungl, 2015). This perspective highlights how the sociotechnical perspective of ST research can bring out dimensions of power that were underemphasized in Fligstein and McAdam's conceptualization. Furthermore, ownership of land can be a crucial source of power (Fuchs and Hinderer, 2014). Market power can also go beyond the ownership of assets and include access to customers as well as to financial resources (Wassermann et al., 2015).

Although ST researchers tend to focus on the different types of economic or material resources, they also study other types of resources. For example, the control over information and expertise is an important form of cultural capital, especially when negotiating in the political field, where policymakers may be reliant on the research and knowledge of industry actors (Blanchet, 2015; Ryder, 2017). Moreover, cultural resources or capital can also be combined effectively with social resources. For example, Wassermann et al. (2015) find that the success of actors in shaping the emerging field of direct marketing of renewable energies depended on both their cultural background, social skills, and motives and on their social capital in the form of links to actors from other fields (e.g., renewable energies, banks). Fuchs and Hinderer (2016a) show that in geographically demarcated fields,

family membership may appear as a highly valuable form of social capital. Generally,

scholars highlight the decisive relevance of contacts with policy makers, which can change

over time (Hess, 2013; Kungl, 2015; Fuchs and Hinderer, 2014).

Some researchers also discussed the importance of reputation (a form of symbolic

capital in Bourdieu's terms). For example, Fuchs (2014) describes how the poor public

reputation of incumbents limited their capacity to gain proposed regulatory changes in their

favor. Similarly, Mey and Diesendorf (2018) describe a case in which the incumbents lost

credibility because they were no longer able to fulfill the societal expectations of maintaining

security of supply. The loss of credibility diminished their capacity to prevent the political

support of alternative technologies. ST researchers also provided some examples of the

conversion of resources, such as economic into symbolic resources. For example, Candido et

al. (2018) provide an example involving companies that spent millions on advertising to

publicize their corporate social responsibility practices in support of waste collectors.

In summary, transition scholars have shown the value of both the incumbent-

challenger relationship and the differentiated understanding of power as linked to forms of

resources or capital. However, ST researchers have also stretched the strict dichotomy of

incumbents and challengers suggested by Fligstein and McAdam, and they have identified

different types of resources on which power struggles in a field are based that were not

included in the discussions of Fligstein and McAdam.

4.2.2 Change, Emergence, and Destabilization

When it comes to the analysis of stability and change in social fields, ST researchers

build on the SAF conceptual categories of fields as stable, in crisis, or emergent. With the

emphasis on innovation in ST studies, it is not surprising that ST researchers often focus on

how new fields emerge around new technologies or through state activities in the form of

publicly funded projects, the creation of new markets, or the establishment of sheltered

niches. The other main area of attention with respect to field change and settlement is how

an established field can become destabilized.

Like existing fields, the development of emerging fields involves conflicts over formal

field rules (Wassermann et al., 2015; Breslau, 2013) as well as over scarce resources and

interpretive power (Canzler et al., 2017). However, in contrast with existing fields, emerging

fields are less clearly defined by the incumbent-challenger relationship. Rather, conflicts

between actors often involve poorly defined relationships as the different actors attempt to

gain the most advantageous position in the relatively disordered social space. The

incumbent-challenger relationship is also less clear because incumbents from other fields

may try to find advantages in emerging fields. For example, Apajalahti et al. (2018) note that

incumbents in existing fields can deploy various tactics to shape emerging fields: creating

credibility and legitimacy for the objective of the field, expanding field boundaries to make

them fit their spectrum of activities, and mobilizing resources in support of the field.

Another contribution of ST research for research on emerging fields is to develop a

better understanding of the conditions under which emerging fields can undergo settlement

or remain unsettled. In the case of an emerging field with (anticipated) resources that are of

interest to various actors in other fields, the negotiation process can be strongly marked by

conflict (Wassermann et al., 2015). However, if a new field is populated by actors who are

characterized by homology (parallel position in terms of power and resources), or if there is

fundamental agreement regarding the goals of the field, a comparatively harmonious

settlement of the field may be possible (Candido et al., 2018). With regard to field

settlement, some researchers follow the suggestions of Fligstein and McAdam and stress the

importance of the formation of internal governance units (Mey and Diesendorf, 2018; Candido et al., 2018). Here, the extent to which the governance unit has been formed from an existing network provides an indication of which group has prevailed if there is conflict in the formation process of the field. In some cases, field settlement can result in a significant reduction in the level of activity of actors, for example when it is accompanied by the settlement of a long-lasting conflict that anchored the identities of the conflicting parties (Mey and Diesendorf, 2018).

With respect to the second main area of attention in ST research on field stability and change, ST researchers identify various causes for the destabilization of an existing order (Apajalahti et al., 2018; Becker et al., 2016; Blanchet, 2015; Candido et al., 2018; Fuchs, 2014; Heiskanen et al., 2018; Kungl, 2015; van Wijk et al., 2013). Unlike SAF theory, which often draws attention to the role of the exogenous shock and sudden change, ST researchers have pointed to the role of incremental change. For example, Mey and Diesendorf (2018) show that field destabilization through state intervention can be a gradual process over a long period of time. ST researchers have also shown how processes of field destabilization involve the reappearance of latent conflicts (Köhrsen, 2018) and the potential for established alliances to break apart (Heiskanen et al., 2018; Kungl, 2015).

Although ST research on field crises and destabilization is not yet well developed, it has helped to improve the understanding of the processes by which new fields emerge and existing fields become destabilized. The main contribution lies in tracing the actors who take part in the formation of a new field back to the fields of their origin and in exploring the conditions under which emerging fields can become stabilized or characterized by ongoing conflict.

4.2.3 Field Rules

With regard to field rules, SAF theory has focused on the role of internal governance units as enforcers of rules. This approach suggests that rules are not neutral arbiters of the relations of actors in a field but instead are part of what is at stake in the tactics of actors who mobilize to change a field and their own position in it. ST research that is in conversation with SAF theory has developed two additional insights into the role of rules in transitions and field change: the ongoing challenge of achieving and stabilizing field rules, and the role of new mechanisms for achieving stability that do not rely on the external imposition of regulations or the role of the internal governance unit.

ST researchers understand that achieving stable field rules such as binding standards is beneficial to a transition because it reduces uncertainty and stimulates the formation of a normative or regulatory structure that can orient further action (e.g., van Wijk et al., 2013). However, rather than focusing on the emergence of external stabilization such as government regulations or internal governance units such as bodies that set industry standards, ST researchers have drawn attention to the ongoing problem of achieving and maintaining stability with broadly accepted field rules. For example, Köhrsen (2018) argues that even in cases where a common understanding of the purpose of the field exists, contrasting ideas about how these goals could be achieved can prevent the formation of stable rules and values. Likewise, Fuchs (2015) uses the example of carbon capture and storage (CCS) to show how the establishment of a technology failed because the politicians involved were unable to agree on a binding legal framework due to differing interests. ST researchers have also shown that destabilization can occur when formal field rules are subject to stretching (Reusswig et al. 2018, Ryder 2017). Furthermore, ST researchers have shown that the migration of actors across fields is a constant source of potential

destabilization. For example, when actors from one field enter another field, their ideas and the interpretation of the dynamics of the field are strongly influenced by the rules, values, and norms of the field of their origin (e.g. Wassermann et al. 2015).

Another source of the instability of field rules involves articulations of future-oriented visions or imaginaries of the field. In other words, the general purpose and the future of the field are also subject to different interpretations. For example, Neukirch (2016) describes a case where the extension of the electricity grid served different visions of the future of the field (that is, enabling the extension of green electricity versus protecting conventional overcapacities). The posture of actors toward grid extension depended on their expectations of the future uses of the technology, which in turn were dependent on their position within the field and their cultural background. Schmid et al. (2016) argue that even if competing visions might not be technically exclusive, integration could be unlikely if those visions are shared by two different actor groups with diverging motives. More generally, Köhrsen (2018) distinguishes the visions of the field along a continuum from an opportunistic (economic) pole to an idealistic (environmental) pole (similar to Bourdieu's economic and cultural poles, Bourdieu, 1996a; 1996b) and thus linked visions and interpretations to the cultural background of the field actors.

In addition to nudging the analysis of field rules in the direction of the analysis of instability, ST researchers have also broken new ground in the understanding of mechanisms for the stabilization of field rules that do not rely on the imposition of external regulations or the often coinciding development of internal governance structures. One possible source of stabilization is the embeddedness of field rules in the cultural identity and practices of actors. For example, Fuchs and Hinderer (2014) show that formal rules can continue to guide action on an informal level even after their official abolition. Another source of stability is

related to group membership. For example, Heiskanen et al. (2018) highlight the relation of the character of the established field rules and the cultural background of the actors involved in the initial formulation of these rules. The stability of these rules and their consistency can be attributed to the fact that the central actors represent an elite group who attended the same educational institutions, shared essential ideals, and were also well connected over time.

In summary, ST researchers build on the idea that the rules of the game are themselves part of what is at stake in the game and thus part of the constant jockeying of actors in a field for changes in relationships and power. However, ST researchers have also emphasized the precarity of settlements and stabilizations of rules, partly because the focus of ST research is on change. ST research has thus identified multiple sources of destabilization of rules, but it has also identified new mechanisms (mainly cultural ones) that can contribute to stability.

4.2.4 Agency, Framing, and Coalitions

With respect to the general capacity of actors to bring about change, ST researchers take Fligstein and McAdam's concept of social skill as a starting point; however, they focus on the "skills" of strategic framing and the associated work of building coalitions. We classified the types of frames analyzed in the ST literature that uses SAF theory into three main categories: uniting, opposing, and accommodating. With respect to the first type, one tactic of actors is to define their goal in terms of a general societal interest, which in part is a legitimation strategy. Examples of such public or general interest goals are climate change, energy security, national stature ('national cleantech strategy', 'Energiewende'), and technological visions or imaginaries (Apajalahti et al., 2018; Kungl, 2015). For example, in the

case of Danish wind power, social movements presented their technology as an alternative

to an unpopular technology (nuclear power) and framed both their opposition and

alternative vision as in the public interest (Mey and Diesendorf, 2018). Another way of

framing a position as uniting is to present the information as factual or scientific. For

example, actors use commissioned scientific reports (Mey and Diesendorf, 2018) or scientific

research to legitimate a rule change that benefits one group of actors at the expense of

others (Breslau, 2013).

Framing can also be used in a much more relational mode as part of counterframing

and accommodation. In a confrontational or opposing mode, actors can use frames to

attempt to delegitimize the opponent by questioning the opponent's rationality or morality

(Becker et al., 2016; Blanchet, 2015). But relational framing can also accommodate the goals

of the dominant actors in the field, and this type of framing can be important in the analysis

of the complexities and non-duality of the challenger-incumbent relationship. For example,

sustainability advocates often switch from an environmental frame to a national security

frame such as energy independence and resilience. Furthermore, socially skilled actors can

use compromises to enforce their interests. For example, Ferns and Amaeshi (2017)

examined how the more powerful of two conflicting parties used an attempted compromise

between two oppositional framings to assert its own interests in the language of

compromise.

In addition to tracking frames with respect to the relations among actors in a field,

some of the studies also explored the relationship between frames and broader cultural

categories and values. For example, arguments of incumbents often mirror the dominant

frame of economy (competitiveness, cost efficiency, economic prosperity, self-control of

markets) (Hess, 2013; Kungl, 2015). In contrast, some green initiatives built cultural

resonances with progressive-left ideals such as democratic control, citizen participation, and

community ownership (Mey and Diesendorf, 2018). Other green initiatives proved successful

because they were linked to conservative ideals such as local value added, regional pride, or

conservation of creation (Fuchs and Hinderer, 2014; 2016a).

The analysis of framing is also integrally connected with the analysis of coalitions

because frames change in response to changes in coalition composition and to the

counterframing of opposing coalitions. On this topic, ST researchers have identified tactics

that are part of the skill of coalition building. For example, actors in a subordinate field

position may form partnerships with those in dominant positions in a neighboring field, thus

making use of countervailing power (Hess, 2013; 2014a). Another specific form of coalition

building is the collaboration of challengers from different fields. For example, Candido et al.

(2018) explain how actors from different fields (religious, municipal government, academic,

and industrial) supported a challenger movement (solidarity recycling) for different

purposes. Because most of the supporters were challengers in their respective fields, the

correspondence of the positions of actors in their respective fields generated some potential

for coalition formation.

With respect to coalitions, SAF theory draws on and recognizes the importance of

social movement theory concepts such as co-optation and brokerage. For various reasons,

including the growth of challengers and external pressure, incumbents may shift their

strategy from marginalization and blockage to absorption and co-optation (Fuchs and

Hinderer, 2014). The processes may result in gains for the challenger, as van Wijk et al. note:

"When multiple actors engage in cultural and relational brokerage between the movement

and the field, members of both groups begin to shape themselves to the meaning system

and social structure they co-create, and co-optation becomes mutual" (van Wijk et al., 2013:

376). Incumbents' acceptance of challengers may result in a compromise for challengers, who may have to accept changes in the design and sociotechnical arrangements that they originally advocated.

In summary, the analysis of agency in work by ST researchers who use field theory is consistent with the SAF concept of social skill, but ST researchers use the concept implicitly in research projects that focus more on the role of framing and coalition building in field change and stability. With regard to framing, ST researchers differentiate various tactics such as uniting, opposing, and accommodating, and they also explore the relationship between the framing tactics of the actors and their cultural background. With respect to coalition building, ST researchers examine different forms of coalitions that often involve the construction of networks across fields, and they connect coalition composition to framing.

4.2.5 Strategic Action in an Interfield Matrix

Fligstein and McAdam emphasize that SAFs are not isolated silos of social space but connected spaces where changes in one field reverberate across other fields. ST researchers generally agree about the importance of interfield relations (i.e., the connections across diverse social fields such as the economic, political, media, and scientific fields). However, ST researchers have also extended SAF theory by examining how interfield relations are a source of strategic action and power.

One implication of this focus on the interfield matrix for strategic action is the selection of an "external" field as a target for action in order to change the dynamics of the field in which actors are positioned. The most obvious choice is the political field. Because the state serves as the ultimate arbiter of a field's rules, actors in an industrial field may spend significant effort trying to influence the state, such as by lobbying for regulations,

taxes, standards, subsidies, or research funding (Apajalahti et al., 2018; Breslau, 2013; Fuchs and Hinderer, 2016b; Kungl, 2015). But the selection of which external field to target is not random and includes what in the policy literature is sometimes referred to as "venue shopping" or assessments of where the best opportunities lie (Ley and Weber 2015). For example, Fuchs and Hinderer (2016a) describe how actors may be able to influence local political fields, but political fields at a greater scale appear to them as unchangeable contexts. Morever, the differential opportunities of various political fields do not always comprise a rigid structural condition. For example, the extent to which different political fields are open or closed to influence depends partly on the "respect" that actors have for the government rules, which means their willingness to challenge the state (Ryder, 2017).

Similarly, relationships across fields can also be a source of strategic action. For example, one line of analysis examines how actors from proximate fields may enter other fields if they see business opportunities or if they are working on technology development projects (Apajalahti et al., 2018). Actors may also mobilize across fields to develop a new field. For example, Canzler et al. (2017) analyzed a case in which actors from different fields (electricity provision, mobility, and information technology) met in the context of a pilot project, which was the nucleus of a new field at the intersection of those three formerly separated fields. Another line of analysis suggests how challengers use relations with other fields to gain more power in the field. For example, in one case incumbents from the field of residential property financing tried to block a property-assessed clean energy program because the financial firms did not want competition for loans; however, the clean energy advocates were able to enroll support from the countervailing power of the technology sector (Hess, 2013).

Another proximate field that can be the target of strategic action is the media field. In most cases, the media field appears as a secondary battleground for conflicts within political and economic fields (e.g., Blanchet, 2015; Becker et al., 2016). However, because the public sphere of mediated political debate can influence public opinion, which in turn can influence political decision-making, action in the media field can also reverberate back to the home field and contribute to field change. But actors who choose to operate in multiple fields must also be cognizant of the different rules of each field in order to be effective. For example, Becker et al. (2016) and Blanchet (2015) show how civil society advocates are simultaneously active in various fields (municipal politics, media, and business) and utilize tactics appropriate to the respective fields (gather signatures, start (social) media campaigns, and try to identify business cases).

In summary, ST researchers build on the general statements about interfield relations in *A Theory of Fields* by including attention to the interfield matrix and the important role of the state-industry relationship. However, ST researchers also have put the "strategy" back into the analysis of the interfield relationship by shifting attention from the structural relations between fields (e.g., of higher or lower levels of dependence or "heteronomy," in Bourdieu's terms) to the ways in which actors mobilize across fields and act simultaneously in multiple fields in order to achieve changes in their primary field of reference.

5. Discussion

This review shows that ST researchers have applied SAF theory to a wide range of ST problems, but it also examines how the engagement with SAF theory is a dynamic process that involves significant new innovation in concepts and research problems. By identifying both the application and development of SAF theory, the review provides a basis for more

systematic uses of SAF theory in ST research and for ongoing empirical research, critical analysis, and theoretical development.

Thus, this review contributes to ST research by demonstrating the growing appreciation of SAF theory, and by implication field theory in general, to problems encountered by ST researchers. SAF theory can help to advance the ST research field by providing a comprehensive and integrated way of thinking about the relations among actors, power, strategy, processes of field change, rules and norms, cultural meanings and framing, alliances and coalitions, and the institutional context or interfield matrix. Whereas some other, related theoretical approaches focus more on structural conditions (e.g., opportunity structures and political economy), cultural meanings and logics, discourse or advocacy coalitions, innovation dynamics (niche and regime), and so on, field theory provides a comprehensive way of thinking about conceptual connections among the different areas of emphasis in meso-level theory. The comprehensive and synthetic perspective of SAF theory and field theory in general is of particular relevance for researchers who are interested in the political and strategic dimensions of sustainability transitions.

However, the additional contribution that we make is to highlight the changes and adjustments to SAF theory that ST researchers have made while drawing on SAF theory in their empirical projects. In this section, we summarize this process of theory application and innovation with respect to the five theoretical clusters that the review identified.

First, ST researchers draw on and modify the concepts of power and actors in SAF theory. The use of SAF theory in ST studies provides a method for the assessment of the relative power of actors, including the differences in their power as the same actors move in different social fields. Especially when Bourdieu's concept of the different forms of capital is used judiciously and in combination with the concept of general resources used by Fligstein

and McAdam, ST researchers provide a concrete way to think about power that is linked to strategic action. But ST researchers move beyond the binary relationship of challenger and incumbent and explore the complex divisions within these two categories. They also draw attention to the different ways in which the relationship can be defined, such as a relationship of different levels of power and one of different postures toward the future direction of the field.

Second, ST researchers who have used SAF theory have drawn attention to research on the emergence of fields and how new fields are constructed and old ones destabilized. Researchers have also shown how actors can strategically seek to develop new fields and the conditions under which emerging fields can achieve a settlement or become mired in ongoing conflict. Actors find opportunities in the creation of new fields, where rules are not yet stabilized and power relations among actors are not yet well defined. In addition, ST researchers have charted out some of the conditions for field destabilization that go beyond the emphasis on exogenous shocks.

Third, ST researchers use SAF theory to study and theorize the role of field rules, which is not well developed in the original statements of Fligstein and McAdam. ST researchers show how rules are contested, modified, enforced, and developed. Because the rules of action serve as both a guide to action in the field and a target of action, the stability of a set of rules that orient action in a field requires ongoing work. ST researchers have developed the theorization of field rules to include the mechanisms for achieving rule stability that go beyond the formal enforcement of external regulations or internal governance units. These mechanisms include the embedding of rules in cultural practices and identities.

Fourth, ST researchers have developed the understanding of agency in their analyses. Although Fligstein and McAdam focused heavily on the concept of social skill, ST researchers focused much more on the basis of strategic action in the intertwined work of framing actors' goals and building coalitions. For example, ST researchers have focused more on the strategic use of cultural meanings as they show how framing strategy is connected with resonating cultural values. ST researchers also draw attention to framing, storylines, visions, and related symbolic and cultural dimensions of transitions, and they draw out the relations between frames, coalition composition, and counterframing by opposing actors in the field. This approach to culture and strategy has some similarities to Bourdieu's (1977) concept of habitus, which has some advantages over Fligstein and McAdam's understanding of social skill because it connects with a semiotic concept of culture. This development in ST research also embeds the analysis of frames and related concepts (imaginaries, visions, or storylines) in a specifiable field of relations of cooperation and conflict.

Finally, ST researchers use SAF theory to show how transitions occur in a structured space of interfield relations that is not limited to industry-industry and industry-state relations. Rather, the interfield matrix includes different fields within the state and relations with the scientific, media, civil society, and other social fields. Attention to the interfield matrix is itself valuable in ST research because it provides a structured and more precise way of populating concepts such as "context" or "landscape." In addition, ST researchers have also begun to show how actors use this matrix as a strategic resource. By going outside the primary field of orientation and simultaneously operating in neighboring fields, actors can leverage new coalition partners and bring pressure on more powerful actors in the original field.

In summary, we show that the relationship between SAF theory and ST research is a dynamic process that goes beyond the application of stabilized concepts. SAF theory has proven valuable in ST research both because of its integrative approach to strategy, power, and institutional dimensions of transitions and because of the value of specific conceptual clusters. However, as ST researchers have taken up SAF theory, they have also provided significant and innovative theoretical modifications across all five conceptual clusters.

6. Conclusion

In recent years, ST researchers have begun to explore the potential of SAF theory for ST research, and in the process they have made modifications to SAF theory. This review advances the development in ST research by showing how the emerging relationship between SAF theory and ST research is a two-way conversation. On the one side, we show that ST researchers have already demonstrated how SAF theory can help to solve problems and inform research frameworks in ST research, particularly when problems of institutional context, power, and conflict are the topic of research. Thus, we have shown how SAF theory is relevant for ST research and that it provides benefits especially because of its attention to the relations of cooperation and conflict among actors in a field. On the other side, we also show how ST researchers are developing, modifying, and hybridizing SAF theory with existing theoretical frameworks that attend to power, agency, and institutional dimensions of transitions. More specifically, this study has identified five theoretical clusters where SAF theory offers opportunities for ST research, but also where the theory faces conceptual challenges that ST researchers have used as a point of departure for further theoretical development.

Against the background of these developments, SAF theory can certainly be seen as a useful framework for ST research. However, depending on the research interest, the range of relevant applications must be kept in mind. SAF theory is probably less suitable if technology in the material sense is at the center of interest or if researchers are interested in broad systemic change that abstracts from the agency of individual or collective actors. SAF theory is most likely to be useful for actor-centered research that focuses on power struggles and the politics of transitions.

The review of the ways in which ST researchers are using and modifying ST research suggests several promising areas for future research. First, SAF theory can be further developed and adjusted to the interest of ST researchers by integrating elements of other theories that are already prominent in transition research. There is strong potential for future integration with ST research building on institutional theory, including the study of institutional entrepreneurship (e.g. Thompson et al., 2015), institutional logics (e.g. Fuenfschilling and Truffer, 2014; Smink et al., 2015), and institutional work (Fuenfschilling and Truffer, 2016; Sarasini, 2013). Another opportunity would be to sharpen the understanding of cultural aspects in SAF theory by exploring central concepts from Bourdieusian field theory such as habitus (Bourdieu 1990) and symbolic power (Wacquant and Akçaoğlu, 2017), which have received little attention in ST transition research to date. Second, the theory offers a promising framework to guide further research on specific problem areas that are central issues of transition research. For example, there is potential for field theory to contribute to research on topics such as field destabilization (Kungl and Geels, 2018); the geography of transitions (Truffer et al., 2015); and policy processes that involve coalitions, storylines, and framing (Hess, 2019; Kern and Rogge 2018). In summary, there is a good opportunity for ST researchers who are concerned with power, agency, and

institutional change to benefit from the judicious use of field theory even as they modify and

adapt it to ST research problems.

Appendix

Overview of the Reviewed Articles by Date and Thematic Focus

Article	Thematic Focus
Apajalahti et al. (2018)	Incumbents' activities in the emerging fields of solar energy and electric vehicles in Finland
Becker et al. (2016)	Local initiatives and conflicts over the remunicipalization of the electricity grid in Hamburg and Berlin
Blanchet (2015)	Local initiatives and conflicts over the remunicipalization of the electricity grid in Berlin
Breslau (2013)	Negotiations about the design of capacity markets in the US and the role of economics for the politics of market formation
Candido et al. (2018)	Historical reconstruction of the emergence of solidarity recycling in Brazil from an interfield perspective
Canzler et al. (2017)	Experimental spaces and the emergence of a new field at the intersection of three formerly separated fields (electricity, mobility and ICT)
Ferns and Amaeshi (2017)	Discourse analysis exploring the shifting role of business in sustainable development at U.N. Earth Summits
Feront and Bertels (2019)	Rise of responsible investment in the field of financial investment in South Africa
Fuchs (2014)	Comparison of the governance process of two different technologies (CCS and solar-PV) in three different countries
Fuchs (2015)	Political negotiations on carbon capture and storage (CCS) in Germany and Norway
Fuchs and Hinderer (2014)	Comparison of four cases of regional energy transitions in Germany regarding space-specific technology mixes and situated governance structures
Fuchs and Hinderer (2016a)	Development of decentralized renewable energy initiatives in the German energy transition
Fuchs and Hinderer (2016b)	Case study about a regional renewable energy initiative focusing on the mobilization process and the influence of neighboring fields
Heiskanen et al. (2018)	Interactions between incumbents and challengers in the field of urban energy provision in two Finnish cities (Helsinki and Tampere)

Hess (2013)	The role of political, industrial and civic actors for the success of four models of distributed solar energy in the United States
Hess (2014b)	The "corralling" of climate science through politics, industry and media and the emergence of an epistemic rift between science and politics
Köhrsen (2018)	Process of urban energy transition in a small German harbor city focusing on context, social skill and power constellation
Kungl (2015)	Role of the incumbent German utilities in the process of the transformation of the German electricity system
Mey and Diesendorf (2018)	Historical trajectory of the field of community renewable energy projects in Denmark
Neukirch (2016)	Comparison of regional protests against the extension of electricity transmission grids in Germany
Reusswig et al. (2018)	Conflicts and governance challenges in the German energy transition
Ryder (2017)	Political negotiations on the regulation of unconventional oil and gas development in two US municipalities
Schmid et al. (2016)	Motives and worldviews of key actors in the transformation process of the German electricity system analyzed across seven functional sub-fields
Schmid et al. (2017)	Mental models of main actors within seven sub-fields of the German electricity sector
Schwarz (2020)	The power of citizens in the context of the planning process of four wind power plants in the south of Germany
van Wijk et al. (2013)	The role of social movements for the sustainable transformation of the Dutch tourism industry
Wassermann et al. (2015)	Structuration of the emerging field of direct marketing of renewable energy in Germany

References

Apajalahti, E.-L., Temmes, A., Lempiälä, T., 2018. Incumbent organisations shaping emerging technological fields: cases of solar photovoltaic and electric vehicle charging. Technol. Anal. Strateg. Manag. 30 (1), 44–57. https://doi.org/10.1080/09537325.2017.1285397.

Avelino, F., Wittmayer, J.M., 2016. Shifting power relations in sustainability transitions: a multi-actor perspective. J. Environ. Policy Plan. 18(5), 628–649. https://doi.org/10.1080/1523908X.2015.1112259.

Becker, S., Blanchet, T., Kunze, C., 2016. Social movements and urban energy policy: assessing contexts, agency and outcomes of remunicipalisation processes in Hamburg and Berlin. Util. Policy 41, 228–236. https://doi.org/10.1016/j.jup.2016.02.001.

Blanchet, T., 2015. Struggle over energy transitions in Berlin: how do grassroots initiatives affect local energy policy-making? Energy Policy 78, 246–254. https://doi.org/10.1016/j.enpol.2014.11.001.

Bourdieu, P., 1977. Outline of a Theory of Practice. Cambridge University Press, Cambridge.

Bourdieu, P., 1986. The forms of capital. In: Richardson, J. (Ed.), Handbook of Theory and Research for the Sociology of Education. Greenwood, Westport, USA, pp. 241–258.

Bourdieu, P., 1990. The Logic of Practice. Stanford University Press, Palo Alto.

Bourdieu, P., 1996a. On Television. Polity Press, New York.

Bourdieu, P., 1996b. The rules of art: genesis and structure of the literary field. Stanford University Press, Palo Alto.

Bourdieu, P., Wacquant, L., 1992. An Invitation to Reflexive Sociology. University of Chicago Press, Chicago.

Breslau, D., 2013. Designing a market-like entity: economics in the politics of market formation. Soc. Stud. Sci. 43(6), 829–851. https://doi.org/10.1177/0306312713493962.

Candido, S.E.A., Soule, F.V., Neto, M.S., 2018. The emergence of "solidarity recycling" in Brazil: structural convergences and strategic actions in interconnected fields. Organ. Environ. 32(3), 1–23. https://doi.org/10.1177/1086026618759835.

Canzler, W., Engels, F., Rogge J.-C., Simon, D., 2017. From "living lab" to strategic action field: bringing together energy, mobility, and information technology in Germany. Energy Res. Soc. Sci. 27, 25–35. https://doi.org/10.1016/j.erss.2017.02.003.

Carrosio, G., 2013. Energy production from biogas in the Italian countryside: policies and organizational models. Energ. Policy 63, 3–9. http://dx.doi.org/10.1016/j.enpol.2013.08.072.

Charmaz, K., 2017. The power of constructivist grounded theory for critical inquiry, Qual. Inq. 23 (1), 34–45.

DiMaggio, P., Powell, W., 1983. The iron cage revisited: institutional isomorphism and collective rationality in organizational fields. Am. Sociol. Rev. 48(2), 147–160. https://doi.org/10.2307/209510.

DiMaggio, P., 1988. Interest and agency in institutional theory. In: Zucker, L. (Ed.), Institutional Patterns and Organizations: Culture and Environment. Ballinger, Cambridge, USA, pp. 3–21.

Doblinger, C., Soppe, B., 2013. Change-actors in the U.S. electric energy system: the role of environmental groups in utility adoption and diffusion of wind power. Energ. Policy 61, 274–284. https://doi.org/10.1016/j.enpol.2013.07.028.

Ferns, G., Amaeshi, K., 2017. Struggles at the summits: discourse coalitions, field boundaries, and the shifting role of business in sustainable development. Bus. Soc. 58(8), 1–39. https://doi.org/10.1177/0007650317701884.

Feront, C., Bertels, S., 2019. The impact of frame ambiguity on field-level change. Organ. Stud. in press. https://doi.org/10.1177/0170840619878467.

Fligstein, N., 2001. Social skill and the theory of fields. Sociol. Theory 19(2), 105–125. https://doi.org/10.1111/0735-2751.00132.

Fligstein, N., McAdam, D., 2011. Towards a general theory of strategic action fields. Sociol. Theory 29(1), 1–26. https://doi.org/10.1111/j.1467-9558.2010.01385.x.

Fligstein, N., McAdam, D., 2012. A Theory of Fields. Oxford University Press, Oxford.

Fuchs, G., 2014. The governance of innovations in the energy sector: between adaptation and exploration. Sci. Tech. Stud. 27, 34–53.

Fuchs, G., 2015. Building the agenda for carbon dioxide capture and storage: limits of EU-activism. In: Tosun, J. et al. (Eds.), Energy Policy Making in the EU, Lecture Notes in Energy 28. Springer, London, 205–223. https://doi.org/10.1007/978-1-4471-6645-0_11.

Fuchs, G., Hinderer, N., 2014. Situative governance and energy transitions in a spatial context: case studies from Germany. Energy Sustain. Soc. 16(4). https://doi.org/10.1186/s13705-014-0016-6.

Fuchs, G., Hinderer, N., 2016a. One or many transitions: local electricity experiments in Germany. Innovation: Eur. J. Soc. Sci. 29(3), 320–336. https://doi:10.1080/13511610.2016.1188683.

Fuchs, G., Hinderer, N., 2016b. Towards a low carbon future: a phenomenology of local electricity experiments in Germany. J. Clean. Prod. 128, 97–104. https://doi.org/10.1016/j.jclepro.2016.03.078.

Fuenfschilling, L., Truffer, B., 2014. The structuration of socio-technical regimes—conceptual foundations from institutional theory. Res. Policy 43(4), 772–791. https://doi.org/10.1016/j.respol.2013.10.010.

Fuenfschilling, L., Truffer, B., 2016. The interplay of institutions, actors and technologies in socio-technical systems—an analysis of transformations in the Australian urban water sector. Technol. Forecast. Soc. Change 103, 298-312. https://doi.org/10.1016/j.techfore.2015.11.023.

Garud, R., Hardy, C., Maguire, S., 2007. Institutional entrepreneurship as embedded agency: an introduction to the special issue. Organ. Stud. 28(7), 957–969. https://doi.org/10.1177/0170840607078958.

Geels, F.W., 2004. From sectoral systems of innovation to socio-technical systems: insights about dynamics and change from sociology and institutional theory. Res. Policy 33, 897–920.

Geels, F.W., 2007. Transformations of large technological systems: a multilevel analysis of the Dutch highway system (1950-2000). Sci. Technol. Hum. Values 32(2), 123–149. https://doi.org/10.1177/0162243906293883.

Geels, F.W., 2014. Reconceptualising the co-evolution of firms-in-industries and their environments: developing an inter-disciplinary triple embeddedness framework. Res. Policy 43(2), 261–277. https://doi.org/10.1016/j.respol.2013.10.006.

Geels, F.W., Kern, F., Fuchs, G., Hinderer, N., Kungl, G., Mylan, J., Neukirch, M., Wassermann, S., 2016. The enactment of socio-technical transition pathways: a reformulated typology and a comparative multi-level analysis of the German and UK low-carbon electricity transitions (1990–2014). Res. Policy 45(4), 896–913. https://doi.org/10.1016/j.respol.2016.01.015.

Heiskanen, E., Apajalahti, E.-L., Matschoss, K., Lovio, R., 2018. Incumbent energy companies navigating the energy transitions: strategic action of bricolage? Environ. Innov. Soc. Tr. 28, 57–69. https://doi.org/10.1016/j.eist.2018.03.001.

Hess, D.J., 2013. Industrial fields and countervailing power: the transformation of distributed solar energy in the United States. Global Environ. Chang. 23, 847–855. https://doi.org/10.1016/j.gloenvcha.2013.01.002.

Hess, D.J., 2014a. Sustainability transitions: a political coalition perspective. Res. Policy 43, 278–283. https://doi.org/10.1016/j.respol.2013.10.008.

Hess, D.J., 2014b. When green became blue: epistemic rift and the corralling of climate science. In: Hess, D.J., Frickel, S. (Eds.), Fields of Knowledge. Science, Politics and Publics in the Neoliberal Age. Vol. 27. Emerald, Bingley, U.K, pp. 123–153.

Hess, D.J., 2019. Coalitions, framing, and the politics of energy transitions: local democracy and community choice in California. Energy Res. Soc. Sci. 50, 38–50. https://doi.org/10.1016/j.erss.2018.11.013.

Hoffman, A.J., 1999. Institutional evolution and change: environmentalism and the U.S. chemical industry. Acad. Manage. J. 42(4), 351–371. https://doi.org/10.5465/257008.

Kern, F., Rogge, K.S., 2018. Harnessing theories of the policy process for analysing the politics of sustainability transitions: a critical survey. Environ. Innov. Soc. Tr. 27, 102–117. https://doi.org/10.1016/j.eist.2017.11.001.

Köhler, J. et al., 2017. A research agenda for the Sustainability Transitions Research Network. December 2017. (downloaded on February 10th 2020 from https://transitionsnetwork.org/wp-content/uploads/2018/01/STRN_Research_Agenda_2017.pdf).

Köhrsen, J., 2018. Exogenous shocks, social skill, and power: urban energy transitions as social fields. Energ. Policy 117, 307–315. https://doi.org/10.1016/j.enpol.2018.03.035.

Kungl, G., 2015. Stewards and sticklers for change? Incumbent energy providers and the politics of the German energy transition. Energy Res. Soc. Sci. 8, 13–23. https://doi.org/10.1016/j.erss.2015.04.009.

Kungl, G., Geels, F.W., 2018. Sequence and alignment of external pressures in industry destabilization: understanding the downfall of incumbent utilities in the German energy

transition (1998-2015). Environ. Innov. Soc. Tr.26, 78–100.

https://doi.org/10.1016/j.eist.2017.05.003

Ley, A., Weber, E., 2015. The adaptive venue shopping framework: how emergent groups choose

environmental policymaking venues. Environ. Pol. 24(5), 703–722.

https://doi.org/10.1080/09644016.2015.1014656.

Maguire, S., Hardy, C., Lawrence, T. B., 2004. Institutional entrepreneurship in emerging fields:

HIV/AIDS treatment advocacy in Canada. Acad. Manage. J. 47(5), 657–679.

https://doi.org/10.2307/20159610.

Markard, J., Truffer, B., 2008. Technological innovation systems and the multi-level perspective:

towards an integrated framework. Res. Policy 37(4), 596–615.

https://doi.org/10.1016/j.respol.2008.01.004.

Markard, J., Wirth, S., Truffer, B., 2016. Institutional dynamics and technology legitimacy—a

framework and a case study on biogas technology. Res. Policy 45(1), 330–344.

https://doi.org/10.1016/j.respol.2015.10.009.

Martin, J.L., 2003. What is field theory? Am. J. Sociol. 109(1), 1–49.

http://dx.doi.org/10.1086/375201.

Mey, F., Diesendorf, M., 2018. Who owns an energy transition? Strategic action fields and

community wind energy in Denmark. Energy Res. Soc. Sci. 35, 108–117.

https://doi.org/10.1016/j.erss.2017.10.044.

Neukirch, M., 2016. Protests against German electricity grid extension as a new social movement? A

journey into the areas of conflict. Energy Sustain. Soc. 6(4). https://doi.org/10.1186/s13705-016-

0069-9.

Reusswig, F., Komendantova, N., Battaglini, A., 2018. New governance challenges and conflicts of the

energy transition: renewable electricity generation and transmission as contested socio-technical

options. In: Scholten, D. (Ed.), The Geopolitics of Renewables, Lect. Notes in Energy, 61. Springer,

Cham, Switzerland, pp., 231–256. https://doi.org/10.1007/978-3-319-67855-9_9.

Ryder, S.S., 2017. Unconventional regulation for unconventional energy in Northern Colorado? Municipalities as strategic actors and innovators in the United States. Energy Res. Soc. Sci. 26, 23–33. https://doi.org/10.1016/j.erss.2017.01.004.

Schmid, E., Knopf, B., Pechan, A., 2016. Putting an energy system transformation into practice: the case of the German Energiewende. Energy Res. Soc. Sci. 11, 263–275. https://doi.org/10.1016/j.erss.2015.11.002.

Schmid, E., Pechan, A., Mehnert, M., Eisenack, K., 2017. Imaging all these futures: On heterogeneous preferences and mental models in the German energy transition. Energy Res. Soc. Sci. 27, 45–56. https://doi.org/10.1016/j.erss.2017.02.012.

Schwarz, L., 2020. Empowered but powerless? Reassessing the citizens' power dynamics of the German energy transition. Energy Res. Soc. Sci. 63, 1–14. https://doi.org/10.1016/j.erss.2019.101405.

Smink, M., Negro, S.O., Niesten, E., Hekkert, M.P., 2015. How mismatching institutional logics hinder niche–regime interaction and how boundary spanners intervene. Technol. Forecast. Soc. Change 100, 225–237. https://doi.org/10.1016/j.techfore.2015.07.004.

Sarasini, S., 2013. Institutional work and climate change: corporate political action in the Swedish electricity industry. Energ. Policy 56, 480–489. https://doi.org/10.1016/j.enpol.2013.01.010.

Stephenson, J., Barton, B., Carrington, G., Gnoth, D., Lawson, R., Thorsnes, P., 2010. Energy cultures: a framework for understanding energy behaviours. Energ. Policy 38, 6120–6129. https://doi.org/10.1016/j.enpol.2010.05.069.

STRN steering group, 2018. Sustainability Transitions Research Network. Newsletter 27, March 2018 (downloaded on January 8th 2020 from https://transitionsnetwork.org/wp-content/uploads/2018/04/27th-STRN-newsletter-.pdf).

Thompson, N.A., Herrmann, A.M., Hekkert, M.P., 2015. How sustainable entrepreneurs engage in institutional change: insights from biomass torrefaction in the Netherlands. J. Clean. Prod. 106, 608–618. https://doi.org/10.1016/j.jclepro.2014.08.011.

Thornton, P.H., Ocasio, W., 1999. Institutional logics and the historical contingency of power in organizations: executive succession in the higher education publishing industry, 1958–1990. Am. J. Sociol. 105(3), 801-843. https://doi.org/10.1086/210361.

Tricco, A.C., Lillie, E., Zarin, W., O'Brien, K.K., Colquhoun, H., Levac, D., Moher, D., Peters, M.D., Horsley, T., Weeks, L. and Hempel, S., 2018. PRISMA extension for scoping reviews (PRISMA-ScR): checklist and explanation. Ann. Intern. Med. 169(7), 467–473. https://doi.org/10.7326/M18-0850.

Truffer, B., Murphy, J.T., Raven, R., 2015. The geography of sustainability transitions. Contours of an emerging theme. Environ. Innov. Soc. Tr. 17, 63–72. https://doi.org/10.1016/j.eist.2015.07.004.

van Wijk, J., Stam, W., Elfring, T., Zietsma, C., Den Hond, F., 2013. Activists and incumbents structuring change: the interplay of agency, culture, and networks in field evolution. Acad. Manage. J. 56(2), 358–386. https://doi.org/10.5465/amj.2008.0355.

Wacquant, L., Akçaoğlu, A., 2017. Practice and symbolic power in Bourdieu: the view from Berkeley. J. Class. Sociol. 17(1), 55–69. https://doi.org/10.1177/1468795X16682145.

Wassermann, S., Reeg, M., Nienhaus, K., 2015. Current challenges of Germany's energy transition project and competing strategies of challengers and incumbents: the case of direct marketing of electricity from renewable energy sources. Energ, Policy 76, 66–75. https://doi.org/10.1016/j.enpol.2014.10.013.

Wirth, S., Markard, J., Truffer, B., Rohracher, H., 2013. Informal institutions matter: professional culture and the development of biogas technology. Environ. Innov. Soc. Tr. 8, 20–41. https://doi.org/10.1016/j.eist.2013.06.002.

Wooten, M., Hoffman, A. 2017. Organizational fields: past, present, future. In R. Greenwood, C. Oliver, T. Lawrence, R. Meyer (Eds.), The Sage Handbook of Organizational Institutionalism. Sage, Beverly Hills, Cal., USA, pp. 55-74.