

Lewin's field theory as a lens for understanding incumbent actors' agency in sustainability transitions

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ABSTRACT

Understanding incumbent actors' behavior is one of the current key targets in sustainability transitions research. Scholars studying incumbents' agency have demanded the inclusion of broader social-science theories that bridge different levels (i.e., individual, group) and enable the inclusion of a multitude of actors' drivers and motives into one coherent framework. The present article suggests that Kurt Lewin's field theory, an influential theory of social and organizational change, may be suited for this purpose. From the perspective of field theory, actors are exposed to various partially conflicting 'field forces' (e.g., related to needs, expectations, or roles). The relative strength of these forces determines actors' decisions and behavior. The paper introduces key concepts of Lewin's field theory and reinterprets incumbents' responses to sustainability transitions from a field-theoretical perspective. It elaborates on potential theoretical and methodical benefits of Lewin's field theory for studying incumbents' agency and closes with a discussion of practical implications.

1. Introduction

The reorientation of incumbent actors is essential to driving sustainability transitions; nevertheless, incumbents' responses to change and innovation are among the crucial under-researched topics in transition studies (Farla et al., 2012; Geels, 2021; Huttunen et al., 2021). While actors and matters of agency arguably are an inherent, implicit part of existing frameworks such as the widely used Multi-level Perspective (MLP, Geels, 2020), "actors are not explicitly represented and often poorly conceptualized" in these theoretical models (de Haan and Rotmans, 2018, p. 276). A nascent stream of research has just begun to "mobiliz[e] insights from social science disciplines" (Geels, 2021, p. 45) to increase the current understanding of incumbent actors' behavior in general, and their reorientation processes in particular.

Despite some steps toward a better understanding of actors' agency (de Haan and Rotmans, 2018; Duygan et al., 2019; Fischer and Newig, 2016; Geels, 2020) and first approaches to including more general theories from the social sciences in transition research (Bögel and Upham, 2018; Huttunen et al., 2021; Upham et al., 2020, 2021), there are still gaps in the current theorizing of incumbent behavior, such as causes of variations in incumbents' responses (Ansari and Krop, 2012; Turnheim and Sovacool, 2020), or reasons for incumbents to change their course of action (e.g., from ignoring to participating in a transition; Kungl, 2015). While some attempts have been made to develop a unified framework to explain various kinds of agency in transitions (e.g., Geels, 2020, 2021), others have argued that such an endeavor seems unfeasible due to ontological and epistemological inconsistencies across theories; instead,

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researchers may specifically choose the appropriate theory for a concrete question or problem at hand (Huttunen et al., 2021).

Following this latter recommendation, this paper suggests a theoretical lens that seems particularly suitable for understanding individual incumbent actors' behavior when confronted with regime changes: Kurt Lewin's *field theory* (Lewin, 1947a, 1947b, 1951). Other prominent field-theoretical concepts place interactions around particular issues at center stage. For example, Bourdieu's (1990, 1993) field theory highlights the relationships of social actors in a certain 'domain of action and authority' (e.g., the academic field, the artistic field). Similarly, the (neo-institutionalist) theory of 'organizational fields' (Scott, 1995; see also Hoffman, 1999; Wooten and Hoffman, 2016) looks at interactions within communities of organizations (e.g., health care organizations, education organizations) that partake of a common meaning system (i.e., institutions). Likewise, the theory of 'strategic action fields' (Fligstein and McAdam, 2011; see also Kungl and Hess, 2021) studies dynamics and power struggles amongst actors within a social order related to a certain issue (e.g., the provision of energy or healthcare). In contrast to these other field-theoretical concepts, the essence of Lewin's field theory is "to produce understanding about what [actors] do and why they do it" (Burnes and Cooke, 2013; p. 421). That is, Lewin puts (individual or collective) actors center stage and focuses on the constellation of field forces that impact on them. Hence, it can be a powerful instrument for analyzing the complex set of partially conflicting forces that incumbents are facing in sustainability transitions, and for understanding their actions based on the constellation of these forces.

The theoretical assumptions outlined in Lewin's publications, however, are not readily applicable to the domain of transition studies but need to be translated for this purpose. The present conceptual paper contributes to transitions research by providing the theoretical fundamentals of Lewin's field theory and reinterpreting incumbent behavior using field-theoretical concepts. For illustration purposes, it introduces the example of *GastroSchool* (a pseudonym), an incumbent actor in the Austrian hospitality industry. Throughout the paper, it will be argued that Lewin's field theory enables the inclusion of a broad range of different intrinsic and extrinsic forces of change (Huttunen et al., 2021) and outlined why and how it may be used to bridge micro- and macro-level perspectives in sustainability transitions, as has recently been called for (e.g., Köhler et al., 2019; Upham et al., 2020). Due to its focus on practical relevance, Lewin's field theory may be particularly suitable as a basis for field experiments and other forms of engaged research (Hoffman, 2021).

This paper is organized as follows. Section 2 sketches the role of incumbents in sustainability transitions and provides a brief overview of research on agency in this context. Next, Section 3 introduces the core arguments of field theory that Lewin developed in diverse articles and book chapters. Section 4 reinterprets incumbent actors' behavior in field-theoretical terms by means of the *GastroSchool* example. Finally, Section 5 discusses theoretical, methodical, and practical implications of using Lewin's theory for understanding incumbents' behavior in transitions.

2. Incumbent actors' behavior in sustainability transitions

2.1. The role of incumbents

Sustainability transitions are "long-term, multi-dimensional, and fundamental transformation processes through which established socio-technical systems shift to more sustainable modes of production and consumption" (Markard et al., 2012, p. 956; see also Köhler et al., 2019; Loorbach et al., 2017; Zolfagharian et al., 2019). The transitions literature uses the notion of a *regime* to refer to the "deep structures (such as engineering beliefs, heuristics, rules of thumb, routines, standardized ways of doing things, policy paradigms, visions, promises, social expectations and norms)" underlying such established socio-technical systems (Geels, 2011, p. 31). Sustainability transitions are often fueled by 'niche-innovations'; that is, new practices which lie outside the dominant rules of the regime.

These transitions are highly contested, conflictual processes (Geels, 2020), at the center of which are *incumbents* (Galeano Galvan et al., 2020). Following Mori (2021, p. 56; based on Steen and Weaver, 2017), incumbents are conceptualized as "actors that are 'established' and 'positioned' in markets". These can be individuals (e.g., a manager of an incumbent company) or collective actors (e.g., an entire company). Incumbents, according to Galeano Galvan et al. (2020, p. 79), are "deeply entrenched in the socio-technical regime. They have accumulated (intangible) resources [...], a strong network position in a regime, and can influence political processes of agenda-setting". Thereby, incumbency is not confined to businesses but includes non-governmental actors, educational and knowledge organizations, trade unions, or user groups (Turnheim and Sovacool, 2020).

Incumbent companies usually have competitive advantage over newcomers or 'niche actors'; however, in the face of path-breaking innovations, incumbency can become a liability and come with various challenges for the incumbent (Ansari and Krop, 2012; Sovacool et al., 2020). Consequently, it has been argued that incumbents "often have vested interests in maintaining the status quo rather than enabling transitions and will often act to strategically protect their privileged position" (Johnstone et al., 2017, p. 148; Stirling, 2019). In earlier work, incumbent actors were thus frequently portrayed as 'regime actors' and stabilizers of the current regime (e.g., Geels, 2005).

More recent empirical research has shown that incumbents can exhibit very heterogeneous responses to and play much more diverse roles in transitions (Kungl, 2015; Mori, 2021; Steen and Weaver, 2017). In some situations, incumbents may indeed delay or ignore transitions in order to maintain the status quo; in other contexts, however, they can also bring about or contribute to regime change (Geels, 2014). Evidence for the latter has been found in diverse domains, including the heavy-vehicle industry (Berggren et al., 2015), intensive medicine (Heinze and Weber, 2016), the energy sector (Apajalahti et al., 2018; Steen and Weaver, 2017), or an entire geographical region (Strambach and Pflitsch, 2020). For example, incumbent firms may position themselves as central actors in emerging fields, adopt niche practices and compete with both entrants and other incumbents, thereby driving and diffusing transitions (Apajalahti et al., 2018; Berggren et al., 2015). Moreover, incumbents actively participating in transitions can provide exemplars of rejection, substitution, or recombination of certain practices, which may later be adopted by other actors in the field (Heinze and

Weber, 2016). By those means, incumbents can even become important drivers of regime change (Strambach and Pflitsch, 2020).

2.2. Boundary conditions of incumbents' varying responses

Because "mainstream actor reorientation is essential to drive the diffusion of societal embedding of niche-innovations and associated system transformation" (Geels, 2021, p. 45), it is crucial to understand under which circumstances incumbent actors will maintain the status quo or change their practices to contribute to sustainability transitions. Two streams of research have begun to tackle this question.

The first stream of research has focused on macro-level aspects that may cause variations in incumbent behavior. For example, studying the Dutch healthcare system, de Haan and Rotmans (2011) distinguished *tensions*, *stress*, and *pressures* within the regime and between the regime and its environment. They argued that these three circumstances lead to different reactions by incumbents and thus to different patterns in transitions. In a similar vein, building on Turnheim and Geels (2013) and Kungl (2015), Kungl and Geels (2018) showed for sustainability transitions in the energy sector that the nature of incumbents' responses is dependent on different kinds of *external* pressures, namely political pressures (e.g., increasing political attention to climate change), social movements (e.g., protests against CO2 storage), market developments (e.g., changing demand), and pressures due to new entrants and technologies (e.g., renewable energy producers; Kungl and Geels, 2018). Despite their merits for understanding boundary conditions and (configurations of) factors underlying incumbents' varying responses, critics have argued that such approaches focus too strongly on contextual factors and fall short of portraying actors' intentions and choices (e.g., de Haan and Rotmans, 2018; building on earlier arguments by Farla et al., 2012; Markard et al., 2012).

The second stream of research has drawn on the organizational and strategic management literature to link external pressures with firm-specific characteristics for explaining incumbent behavior in the context of innovation. For instance, Ansari and Krop (2012) developed a generic framework that considers the industry setting (e.g., suppliers, rivalry), incumbent-firm properties (e.g., core competencies, capabilities for change), and the nature of the challenge (e.g., type of innovation) as predictors of incumbents' struggles. Their findings bolster earlier theorizing on the performance of incumbents in the face of radical innovation (Hill and Rothaermel, 2003). Similarly, Steen and Weaver (2017) explained different approaches to firm diversification by differences in the opportunity structure of incumbents and Mori (2021) observed that incumbent companies' heterogeneous responses are due to configurations of firm-specific, socio-economic, and institutional barriers and opportunities. Finally, van Mossel et al. (2018) used different organizational theories (e.g., behavioral theory of the firm, resource-based view) to make propositions on incumbents' behavior in relation to niche developments. For example, they argued that incumbents whose organizational privileges are threatened will delay a transition, or that 'incumbent generalists' and small incumbents will follow into niches. Nevertheless, this second stream of research is also focused mostly on organizational configurations and structures (e.g., the organization's capabilities) as well as actors' responses to market dynamics (e.g., emerging opportunities), and does not consider actors' other potential values, goals, or interests.

2.3. Incumbents' agency in sustainability transitions

To overcome the aforementioned limitations, some have called for a better understanding of incumbents' *agency* in the context of sustainability transitions (de Haan and Rotmans, 2018; Farla et al., 2012; Markard et al., 2012). The notion of agency refers to actors' "ability to take action and make a difference over a course of events" (Giddens, 1984, p. 14); this includes the possibility of free choice and the intention to have an impact on one's environment. In more simple terms, it is related to questions of why incumbents do (not) participate in sustainability transitions. While actors and matters of agency are an implicit part of existing macro-level frameworks such as the MLP (Geels, 2020), their motives and behavior are underspecified in these theoretical models (de Haan and Rotmans, 2018).

To close this gap, several scholars have begun to explicitly theorize on agency in sustainability transitions. For instance, de Haan and Rotmans (2018) developed a theoretical framework that models actors' activities and changing roles in the course of systemic (regime) change. They focused their analysis on value-driven 'transformative actors'; that is, those actors that actively promote sustainability transitions. In a similar vein, Duygan et al. (2019, p. 14) studied "the key constituent elements of agency that are relevant for maintaining, disrupting, changing or creating new institutions". Based on an illustrative case study of Swiss waste management, they suggested that three elements are pertinent for actors to realize strategic actions and transform institutions; namely (1) the actor's resources, (2) discourses that convey their beliefs and motives and serve as means for collective sense-making, and (3) social networks and the actors' position in relation to others. Both de Haan and Rotmans (2018) and Duygan et al. (2019) looked at proactive 'change agents' rather than incumbent actors; hence, notwithstanding the relevance of their research, their analyses cannot explain incumbents' responses to regime change.

In a complementary stream of research, calls have mounted to mobilize insights from seminal social-science theories to increase the current understanding of incumbent actors' agency in sustainability transitions (Geels, 2021; cp. Köhler et al., 2019). Geels (2021) himself addressed these calls by starting from the MLP and incorporating a multitude of existing social-science theories that may explain a certain aspect of agency at the landscape, regime, and niche level. Geels' analysis can be seen as a 'map' of where to locate a particular theory in the MLP. Relatedly, Huttunen et al. (2021) provided a collection of social-science theories (i.e., institutional, socio-psychological, and practice and relational theories) and sketched how these theories may widen the current understanding of agency in sustainability transitions. They concluded that instead of a single coherent framework of agency in transition studies (as partly attempted by Geels, 2021), researchers of sustainability transitions should always look for the appropriate social-science theory to study a concrete problem at hand (Huttunen et al., 2021).

In line with this latter suggestion, Bögel and Upham (2018; see also Upham et al., 2021) reviewed existing psychological theories and concepts with regard to their potential of making amendments to models of sustainability transitions. They found a number of candidate concepts (e.g., psychology of values, learning theory, identity theory) that may be used to explain certain aspects of actors' behavior in sustainability transitions. Based on these reviews, Upham et al. (2020; see also Huttunen et al., 2021) suggested that future work on agency should emphasize psychological concepts that make use of the more *social* of social-psychological theories (i.e., those at the interface of psychology and sociology) that inherently bridge different levels, and employ multi-scale frameworks that depict and trace actor-related mechanisms across levels or situations. Huttunen et al. (2021, p. 3f) concluded that, in order to understand sustainability transitions, we need studies that enable "a more systematic inclusion of varying values, identities, motivations and purposes of actors" (for similar arguments, see de Vries et al., 2021).

In sum, although incumbent actors' agency features prominently in the sustainability transition literature (de Haan and Rotmans, 2018; Duygan et al., 2019; Farla et al., 2012; Fischer and Newig, 2016; Geels, 2020), and despite a recent trend to include more general theories from the social sciences into transition research (Bögel and Upham, 2018; Huttunen et al., 2021; Upham et al., 2020, 2021), there is still a lack of theoretical understanding on when and why incumbents will participate in regime change or oppose it (Turnheim and Sovacool, 2020). The present paper argues that Kurt Lewin's *field theory* (Lewin, 1947a, 1947b, 1951) has the potential to close this theoretical gap.

3. Kurt Lewin's Field Theory

Lewin was one of the most renowned social scientists of his generation (Marrow, 1969; Schein, 1988; Tolman, 1948) and his field theory is still amongst the most important theories of social and organizational change (Burnes, 2004; Burnes and Cooke 2013; Crosby, 2021; Stouten et al., 2018). Yet, partly due to his sudden death in 1947, there is no complete and comprehensive representation of Lewin's field theory; instead, ideas are distributed across studies and essays on various topics ranging from child development to the cultural change of the German nation under the influence of Adolf Hitler during World War II (Lewin, 1948). Some of the most influential articles, including Lewin (1947a, 1947b), were posthumously published in an anthology entitled 'Field Theory in the Social Sciences' (Lewin, 1951). The following subsections synthesize elaborations from these articles and concisely introduce core concepts of Lewin's field theory that are relevant for theorizing on incumbents' behavior in transition processes.

3.1. The notion of the 'field'

Lewin's field theory integrates the individual and social processes underlying social change in a common theoretical framework. The term *field*, accordingly, is used both at the individual and group levels.

At the individual level, Lewin presupposes the existence of a *psychological field* that comprises the totality of (subjectively perceived) coexisting facts at a certain point in time (Burnes and Bargal, 2017; Burnes and Cooke, 2013; Lewin, 1943a, 1946, 1951). This 'field' includes characteristics of the individual (e.g., knowledge, attitudes, physical aspects), as well as characteristics of the environment as perceived by the individual (e.g., perception of the physical environment, perception of relevant others).

At the group level, there is a *social field* that "consists of the group and its environment as it exists for the group" at a given time (Lewin, 1951, p. xi). Lewin (1939, 1951) uses the term 'group' to refer to a set of actors who depend on each other for achieving certain goals (e.g., members of an organization, managers of companies along a supply chain). Hence, for Lewin, the defining feature of a social group is *interdependence*. This interdependence among members may be due to different reasons such as a formal contract, economic dependence, or a feeling of loyalty or belongingness (Lewin, 1939, 1951). From the perspective of Lewin's field theory, groups can range from a very small entity (e.g., a team) to a large set of actors (e.g., a nation).

3.2. Agency as a function of field forces

Lewin's core assumption is that *all human behavior is a function of the field at a given time* (Lewin, 1943a, 1946, 1951). Within each individual's psychological field, there are different *field forces* that are related to diverse behavioral alternatives. Field forces can be understood as motivators or drivers of behavior, which may be intrinsic or extrinsic (Lewin, 1946, called such extrinsic forces 'induced forces'). Individual intrinsic field forces include personal values (e.g., environment-related values, the desire for social justice), needs (e.g., food, safety), or desires (e.g., the desire to be rewarded or accepted); individual extrinsic forces can be all kinds of anticipated external rewards (e.g., salary) or punishments (e.g., social exclusion, penalties), as well as perceived social expectations by others (Lewin, 1946, 1947b, 1951). Actors do not necessarily have to be aware of these forces or reflect on them. Yet, each of the—conscious or unconscious—forces is related to particular behavioral alternatives and has a certain strength, which may vary over time, for example, due to changes in the situation.

Groups as a whole are also exposed to various field forces that serve as boundary conditions of social life (Lewin, 1943a, 1947a). Like at the individual level, group-level field forces may be intrinsic to the group, such as group identity (e.g., as 'elite') or group norms (e.g., regarding 'adequate behavior'), or they may be extrinsic, such as market dynamics (e.g., customer needs, competitors' behavior), regulations (e.g., EU taxonomy regulation), or subsidies (e.g., for more sustainable practices). These forces are related to behavioral alternatives of the group. Forces at the group level are in continuous flux, too.

In field-theoretical terms, agency results from the constellation of field forces (Burnes and Cooke, 2013; Lewin, 1943a, 1946, 1947a). Usually, multiple forces are present in a psychological or social field. Forces of approximately equal strength in opposing directions cause *force conflicts* (Lewin, 1946; 1947b; 1951); the stronger these opposing forces are, the stronger the conflicts will be.

Lewin (1946, 1951) identified various types of conflicts, such as between driving forces that push in different directions, or between intrinsic and extrinsic forces. In this context, he also outlined the role of *barriers* that can prevent actors from acting upon a particular force. Barriers, both at the individual and group level, may include lacking knowledge and skills, too high costs, technology lock-ins, or legal constraints.

3.3. Change and stability in social fields

Once a social group has overcome a certain ‘forming’ phase where group members try out different ways to account for their interdependence, actions in a social field become relatively constant and routinized. Lewin (1947a, p. 13) used the notion of “quasi-stationary equilibria” to describe such situations as dynamic processes within social fields where fluctuations occur all the time but a recognizable form is maintained (Burnes and Cooke, 2013). In Lewin’s (1947a, p. 15) terms, “we are dealing with a process which, like a river, continuously changes its elements even if its velocity and direction remain the same”. Hence, in Lewin’s (1947a, 1951) view, the observable behavior should be seen as an *epiphenomenon* that occurs due to the underlying constellation of forces within the social field.

Lewin (1947b, p. 151) defines a “change” in a social field as “the difference between a preceding situation and a following situation which has emerged out of the first as a result of some inner or outer influences”. In his view, change takes place when the equilibrium in a force field is shifted to a different ‘level’ (Lewin, 1947a), for example, a higher level of sustainable practices within an organization, or an entire industry. Such a “change from the present level to the desired one” (Lewin, 1947a, p. 32) can only take place when forces in favor of the change exceed opposing forces. Moreover, in order for *permanent* change to take place, force fields themselves have to be changed such that forces stabilizing the ‘new’ (e.g., more sustainable) practices permanently outweigh forces pertaining to the ‘old’. These latter assumptions from field theory are abbreviated in Lewin’s (1947a) frequently cited three-staged model of change according to which change in a group’s force field occurs through *unfreezing* the status quo, *changing* the behavior, and *refreezing* the new practices.

4. Interpreting incumbent actors’ behavior in terms of field theory

The following sub-sections elaborate on how Lewin’s field theory (1947a; 1947b; 1951) can help explain incumbent actors’ responses to sustainability transitions by considering shifts in the constellation of field forces. For illustration purposes, the paper uses the example of the incumbent organization *GastroSchool*, a traditional vocational school in Austria that has been training cook apprentices for several decades. In the 2021–2022 school year, a new teacher joined the school and raised awareness of the issue of sustainability in the hospitality sector. He tried to get *GastroSchool* to take part in the sustainability transition of the food system by, for example, changing the procurement of vegetables and meat to more organic sources, cooking vegetarian dishes, and reducing food waste. The examples below stem from an analysis of strategic documents (e.g., the school’s mission statement), information on the school’s history, its structure (an organizational chart, information on ownership structures), and a 90-minute interview (in January 2022) with the teacher who had taken that sustainability initiative.

4.1. Incumbents’ field forces

Fig. 1 schematically displays the force field of an individual at an incumbent organization like, for example, *GastroSchool*’s

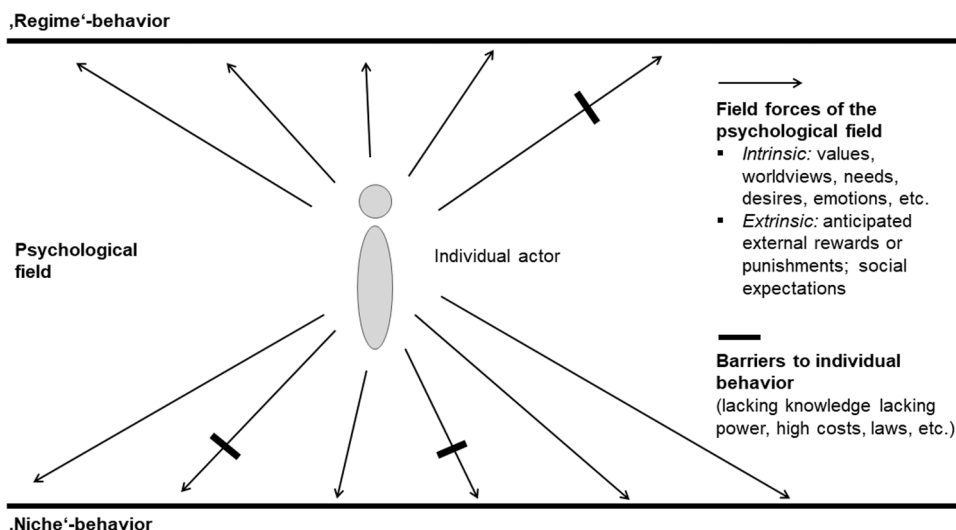


Fig. 1. Field forces and barriers for individual incumbent actors.

principal, who was confronted with sustainability transitions in the food industry. Other individual actors at *GastroSchool* could be long-standing teachers or the head of the school canteen run by the students. In the actors' force fields, some forces are pushing toward the well-established 'regime' practices (at the top of Fig. 1) whereas other factors may motivate them to do something different and more sustainable (indicated as 'niche' behavior at the bottom of Fig. 1).

Individual-level forces may include individual psychological factors such as sustainability-related values, norms, beliefs, or identities, which are widely used to explain individual behavior outside transition research (Upham et al., 2021). For example, forces driving *GastroSchool*'s principal may values and norms related to what is 'good food'. Individual-level forces can also include individual managers' perceptions of environment-related threats (Kump, 2021), strategic considerations (Geels, 2014), or perceptions of contextual factors, such as changes in customer demands, policies, and taxes (Steen and Weaver, 2017). For instance, *GastroSchool*'s principal wanted to keep his market position as one of the top gastronomy schools for traditional Austrian cuisine. At the same time, he observed a change in 'customer' behavior; that is, a trend in changing food habits in the younger generation. All these individual perceptions of the situation can be related to a range of emotions, such as pride, fear, or hope (Martiskainen and Sovacool, 2021), which are also part of the constellation of forces in the individual's force field.

Field theory also helps to understand the social fields of incumbent actor groups. For example, *GastroSchool* itself could be seen as a group of individual actors (principal, teachers, etc.) who are interdependent to deliver high-quality chef training. Another group would be *GastroSchool*'s network of suppliers, or the broader network of restaurants hiring its graduates. The social field may then comprise individual actors (e.g., small farmers providing organic meat; restaurant managers hiring *GastroSchool*'s graduates) as well as collective actors (e.g., the entire school, large suppliers) that are interdependent, for example, due to supply-and-demand relationships.

Fig. 2 schematically shows the social field of a group of actors. Also, at the group level, certain forces may be related to well-established 'regime' practices, whereas other factors may motivate new group practices ('niche' behavior in Fig. 2). The social field may include forces that are intrinsic to the group, like incumbents' shared norms and values (Geels, 2014; Sovacool and Griffiths, 2020) or their resources, competitive strategy, and perception of current or future business opportunities (Mori, 2021; Steen and Weaver, 2017; van Mossel et al., 2018). It may also comprise forces that are extrinsic to the group, such as political pressures, social movements or market developments (Ansari and Krop, 2012; Kungl, 2015; Kungl and Geels, 2018; Turnheim and Geels, 2013). *GastroSchool*, for instance, was pursuing the strategy of being one of the elite institutions for chef training ("When our students leave the school, they can really cook!", said one teacher at *GastroSchool*) and thus had strong norms of what kind of dishes chefs need to be able to prepare. Regarding external forces, they were experiencing changing demands by students, in particular, related to local and seasonal food and vegetarian dishes.

By explicitly including both extrinsic and intrinsic aspects (Lewin, 1946), Lewin's field theory provides the possibility to integrate a multitude of forces into one common theoretical framework. It presupposes that extrinsic factors such as existing regime structures (e.g., policy paradigms, rules, standard procedures) or landscape pressures as interpreted by individual actors interact with intrinsic factors—such as decision makers' personal values, beliefs, or needs—to motivate a particular behavior.

4.2. Incumbents' force conflicts and barriers

As outlined in Section 3.2, the forces in incumbents' force fields may be in conflict. For Lewin (1951, p. 260), a force conflict is a situation "where forces [...] are opposite in direction and about equal in strength". Lewin (1946) elaborated in detail on different types of force conflicts. Amongst the most relevant in the context of incumbent behavior are conflicts *between driving forces*. Assume, for example, that *GastroSchool*'s principal and teachers perceive moral conflicts because they feel that some of their practices are 'wrong'

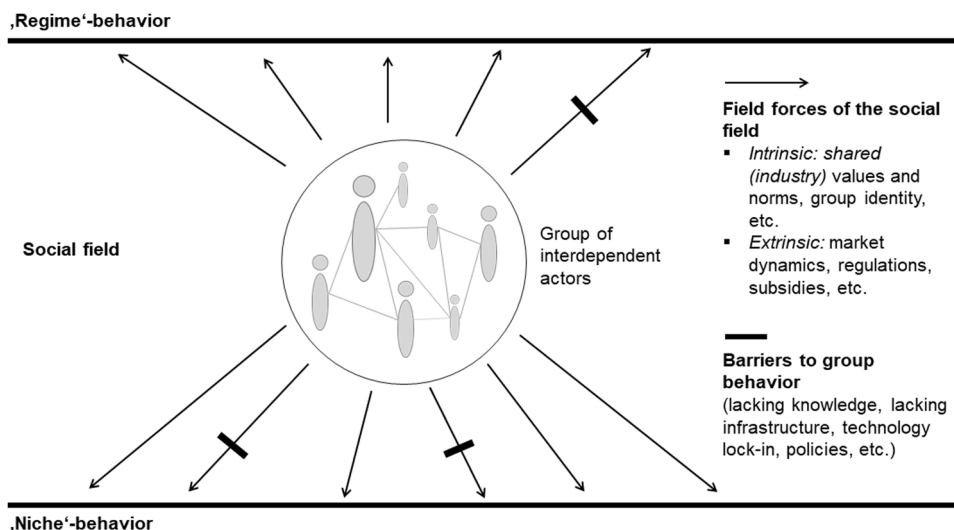


Fig. 2. Field forces and barriers for groups of incumbent actors.

or outdated (e.g., too strong a focus on meat; too little consideration of local and seasonal production), but still behave in line with regime practices because external forces (e.g., lower costs, high demand from restaurants for ‘traditional’ ways of cooking) outweigh these intrinsic forces. Hence, they face a conflict between ‘acting upon their values’ and ‘acting in line with regime norms’.

A second prevalent form of conflict is *between a positive and negative valence*, for example, when an undesired or disagreeable practice promises an attractive reward, or a desirable practice is ‘punished’ (Lewin, 1946). For instance, consider that *GastroSchool*’s members are convinced of their approach to cooking, but many young apprentices go to other schools because they want to learn more modern ways of preparing food. In this case, *GastroSchool* faces a conflict between the ‘desire to act in line with their norms’ and ‘threats to lose students with alternative demands’.

Furthermore, conflicts may exist *between driving and restraining forces* (i.e., barriers; Lewin, 1946). At the individual level, barriers may prevent individual actors from pursuing a certain goal, despite a force related to it. Such barriers may be due to lacking knowledge and skills or lacking decision-making power. Returning to *GastroSchool*’s principal, barriers to changing toward sustainable practices could include lacking knowledge of alternative forms of cooking, or long-term contracts with teachers who refuse to change the contents of their classes. Known potential barriers in the social field that may prevent incumbents from pursuing their goals despite strong forces include policies and regulations (Geels, 2014) and lacking (organizational) knowledge and resources (Ansari and Krop, 2012; Geels, 2014; Steen and Weaver, 2017; van Mossel et al., 2018). For example, *GastroSchool* was confronted with specifications from the trade association on what to teach their students and, as an organization, still lacked the knowledge and capabilities to cook in a ‘more sustainable’ way (i.e., less meat, regional and seasonal products).

4.3. Incumbents’ reactions to regime change

While others have studied patterns of regime change (de Haan and Rotmans, 2011; Geels and Schot, 2007) as well as destabilization and decline (Kungl and Geels, 2018; Turnheim and Geels, 2013) at the macro (i.e., industry) level, less attention has been paid to incumbents’ agency in these processes.

Lewin’s field theory enables a detailed analysis of incumbents’ responses to attempts of regime change. The status quo of an organization can be seen as being in a *dynamic equilibrium* (Lewin, 1947a), where behavior is always in flux but reveals a similar outcome. For example, *GastroSchool* had a curriculum that was based on governmental guidelines, similarly taught every year by changing teachers with only slight modifications to always new groups of students. The curriculum consisted of a collection of recipes that were regularly cooked in the canteen by varying teams of cooks, and the school was embedded in a network of long-standing supply-chain relationships with different suppliers.

Lewin’s field theory implies that incumbents reenact an existing regime as long as strong forces are pushing toward ‘regime practices’ and weaker forces pushing toward alternative practices. In their work on the destabilization of existing industry regimes, Turnheim and Geels (2013) used Lewin’s (1947a) argument that social change entails a sequence of *unfreezing-change-refreezing* and portrayed regime destabilization as a process of *unfreezing*. Lewin’s metaphor of ‘unfreezing’ refers to a change in the constellation of field forces where forces against the status quo become stronger than forces for maintaining the status quo of the regime. In the *GastroSchool* example, changes in collective norms of what is ‘good food’, changes in demand by current or prospective students, or internal change agents with a strong vision (such as the new teacher promoting change toward sustainability) may alter the constellation of forces, thereby *unfreezing* the status quo.

To understand incumbents’ responses to attempted changes in regime practices, it is necessary to investigate the effects of these changes on force fields, in particular, on force conflicts. For instance, assume that *GastroSchool* acts in line with regime practices (i.e., it teaches ‘traditional cooking’) mainly due to external forces (e.g., pressure from the vocational association), but that many of its members have strong values related to sustainable food. If there are regime changes toward more sustainable practices, force conflicts would decrease for *GastroSchool* because they could then act more in accordance with their values. In contrast, assume that *GastroSchool* shows ‘regime behavior’ because the school’s collective values, norms, and knowledge are in line with the existing regime. In this latter case, a change toward more sustainable practices in the hospitality industry would increase force conflicts for *GastroSchool*, which might then react with resistance to the change to reduce that conflict. These examples illustrate that a focus on force conflicts can help to understand incumbents’ different reactions to sustainability transitions.

In conclusion, using a field-theoretical lens, incumbents’ behavior can be seen as a skillful way to navigate the different types of force conflicts they are facing. Thus, incumbent actors’ responses to sustainability transitions depend on the nature of change in the constellation of forces and force conflicts. If the envisioned regime change *reduces* conflicts in their field forces, incumbents are likely to show positive responses; if forces toward new practices outweigh forces toward ‘regime practices’, these incumbents may even become early adopters or change agents (e.g., Apajalahti et al., 2018; Steen and Weaver, 2017). However, if sustainability transitions *induce* or *increase* force conflicts, incumbents may react with resistance and attempt to protect their interests and maintain the status quo (e.g., Johnstone et al., 2017, p. 148; Stirling, 2019).

5. Discussion

By reinterpreting concepts of sustainability transitions research through the lens of Lewin’s field theory, the present paper responds to earlier calls for a better understanding of incumbent behavior (Geels, 2021; Turnheim and Sovacool, 2020), as well as the inclusion of broader social-science theories in sustainability transitions research (Köhler et al., 2019). The following subsections discuss theoretical, methodical, and practical implications of using Lewin’s field theory as a lens for studying incumbents’ agency in sustainability transitions.

5.1. Theoretical implications

Lewin's field theory focuses on social change and transition processes and provides micro-foundations for transitions—a theoretical perspective that is complementary to existing models of sustainability transitions that take a macro-level view (Köhler et al., 2019). Despite its roots in psychology, Lewin's field theory overcomes the common problem of focusing too strongly on individual-level aspects (de Vries et al., 2021) by including the external environment as 'field forces'. Unlike other, more isolated psychological explanations (Bögel and Upham, 2018), Lewin's notion of the social field explicitly considers that agency is always in relation to the social networks and contexts in which it is embedded (Geels, 2020). In Lewin's view, the psychological and social fields are strongly interrelated because an individual's social environment—that is, other individuals—are the most important environmental factors that influence behavior (Lewin, 1951). Hence, Lewin's field theory integrates both individual (psychological) and social processes, as called for by Upham et al. (2020), Huttunen et al. (2021), and Köhler et al. (2019).

Lewin's field theory suggests that fields are determined by an individual or shared perception of the situation (Lewin, 1951; see also Burnes and Cooke, 2013), which echoes Geels' (2020) argument that socio-technical transitions are *interpretive processes*. By putting the focus on the *interpreters* of the forces—the individual in the case of the psychological field and the group in the case of the social field—Lewin's field theory makes it possible to consider forces of very heterogeneous origins in one and the same model, as demanded by Huttunen et al. (2021). For example, the force field of *GastroSchool's* principal may comprise as different forces as his values, the school's long-term strategy, obligations due to his role and contract, and the expectations of his peers. Considering how all forces are at play together can enable a thorough analysis of transitions as (not) occurring.

Furthermore, in line with Geels' (2020) argument that agency in sustainability transitions is always *directed towards something* (e.g., a goal), field theory emphasizes the role of directed field forces in the production of behavior (Lewin, 1943a, 1946; 1951). Thereby, Lewin's field theory does not look at different factors in isolation but captures the complexity of social situations by focusing on the *constellation of forces*. For instance, in an existing socio-technical regime, field theory suggests that only incumbent actors with strong forces directed to regime change (e.g., sustainability-related values, changing customer demands) that override many other forces in their force field related to regime practices (e.g., desire for profit, efficiency) will be early adopters of sustainability transitions.

By theorizing on the dynamic nature of fields (Lewin, 1947a), field theory explicitly accounts for the *evolutionary processes* underlying changes, which are typical for sustainability transitions (Geels, 2020). Concretely, field theory assumes that fields are in continuous flux (Lewin, 1947a, 1947b); changes in one actor's practices may change both that individual actor's field and the entire group's social field. For example, the success of pioneering ideas related to organic food in a hospitality school may encourage the school to pursue further initiatives. Moreover, it may change other incumbent actors' (e.g., other schools, restaurants) force fields. By showing that sustainability can be a potentially promising business model, for instance, it may inspire actors with weaker sustainability values to start new ventures in the 'sustainable food' niche. Through such processes, niche practices may gain momentum, and spur emerging sustainability transitions. Based on rigorous empirical (and mostly experimental) research, Lewin (1951) provided detailed elaborations on how valences in force fields can change, some of which may be translated to the situation of incumbents in sustainability transitions in future research.

As a potential limitation, similar to other models in transition research (such as the MLP, which speaks of 'regime structures'), Lewin's field theory is rather generic. In order to understand a concrete situation at hand (e.g., incumbent behavior in the Austrian food regime), it has to be 'instantiated' with empirical data to identify the relevant forces at play. However, this limitation can be overcome, as field theory allows the narrowing down and concretizing of the set of forces that are relevant for a particular research question. For example, in his study on food consumption patterns, Lewin (1943b) identified *types of forces* (e.g., food-related values, food needs, obstacles related to accessing food) that may be considered when trying to understand the food consumption behavior of specific groups or individuals. Likewise, future work in the context of incumbents' agency may be dedicated to developing models of types of forces that are likely to be at play for incumbents in sustainability transitions. Section 4.1. (see also Fig. 1 and Fig. 2) provided a number of elements that these more concrete models may include, such as cognitive aspects, strategic considerations, and (perceived) characteristics of the situation. These elements may serve as a starting point for more systematic model development.

Finally, besides an understanding of core processes in sustainability transitions, Lewin's field theory provides many additional theoretical explanations of human behavior in the context of change. For instance, Lewin (1946, 1951) theorized on the effects of different forms of external influence (e.g., reward, threat) on changes in individuals' psychological fields, in particular the valences of different behavioral alternatives. He further elaborated on how learning reshapes the psychological field and how changes in knowledge (e.g., about more sustainable practices) may change the valences of behavioral alternatives (e.g., new forms of production). These in-depth considerations of individual and collective processes are but a few of the potential ways in which Lewin's field theory could enhance the current understanding of incumbent behavior that may be considered in future theoretical and empirical research.

5.2. Methodical implications

One of the central claims of field theory is that, when it comes to understanding change, the "real object of study is the constellation of forces" (Lewin, 1951, p. 174; see also Lewin, 1943b). To this end, Lewin and his colleagues developed a set of approaches and research methods. One of these techniques, 'force field analysis', has been widely used by practitioners of organization development, albeit in an overly simplified way (Burnes and Cooke, 2013). Yet it was shown that this oversimplification can be overcome (Swanson and Creed, 2014), and a nuanced force field analysis may be a powerful first step in mapping incumbent actors' psychological or social field forces. Scholars may therefore apply rigorous standard procedures of qualitative research, like qualitative interviews and content analyses, to identify field forces for (types of) incumbent actors in a social field.

On a related note, Lewin (1943b, 1947b, 1951) developed the idea of ‘channels’; that is, pathways through which certain goods and artifacts enter the social sphere of the group. For instance, in the *GastroSchool* example introduced above, raw materials and ingredients (e.g., meat, vegetables) are procured via different channels—for instance, via a ‘hypermarket channel’ versus a ‘smallholder farmers channel’. Each of these channels is subdivided into different segments (e.g., planning of menus, order of products, delivery, products, storage and cooling, cooking, preparation) which function as ‘gates’ and are governed either by impartial rules or by ‘gatekeepers’ (Lewin 1947b). For instance, the chef of *GastroSchool*’s canteen serves as a gatekeeper at an early stage in the channel, because he plans the menu and decides whether dishes are meat-heavy or vegetarian; likewise, cooking teachers decide how to prepare the food and what to do with the food waste, thus serving as gatekeepers during ‘cooking’. Hence, the behavior in these channels depends on the gatekeepers’ field forces, and the total situation (e.g., when the freezer is getting full, forces against buying frozen food will be increased). Transferring these ideas to the context of incumbent behavior, the diagnostic task is to identify the channels, the segments, and the gatekeepers to analyze their force fields. Understanding them in detail may enable accurate predictions of certain (types of) incumbents’ responses to transitions.

5.3. Practical implications

As mentioned in the introduction to this article, the change of incumbent actors toward more sustainable practices is essential to driving sustainability transitions. Lewin’s field theory provides a number of starting points for changing incumbent behavior.

Based on findings from a study on food habits, Lewin (1943b, 1951) identified a set of possible areas of intervention which can be translated to the *GastroSchool* example: (i) change in availability (e.g., an increase in the amount of organic/non-organic food in the supply chain); (ii) change in channels (e.g., it becoming easier/more difficult to get organic food); (iii) change in mental models (e.g., a change in the relevance of meat for cooking ‘good food’); (iv) change in values (e.g., the sustainability in food consumption becomes more important); and (v) change of group membership (e.g., it becoming a member of the ‘sustainability movement’). Change agents may take these empirically identified areas as starting points for designing interventions and triggering alterations in incumbent behavior.

Moreover, when it comes to changing incumbents’ practices, Lewin’s (1943b) experiments revealed that interventions which involve ‘group decisions’ where an entire group discusses potential behavioral alternatives and makes a common decision on how to act in the future are much more effective than interventions that aim at changing actors’ psychological fields individually. Translated to the context of incumbent actors in sustainability transitions, this implies, for example, that it could be both easier and more effective to convince an entire group of CEOs in an existing regime to change their behavior than one CEO alone. Building on these and other findings, Lewin (1947a) provided detailed formal elaborations on the nature of force fields and how to change them, putting particular emphasis on the role of group standards and values (e.g., food-related norms) in the context of change. Further, Lewin (1947a) theorized on effects of learning and training (e.g., increased efficiency through better knowledge can change field forces) and considered circular causal effects in social change.

In conclusion, Lewin’s field theory mobilizes insights from the social sciences (Geels, 2021) to enable an increased understanding of incumbent actors’ responses to and agency in sustainability transitions (de Haan and Rotmans, 2018; Turnheim and Sovacool, 2020). It provides a sound theory and a consistent set of empirical methods for understanding incumbent behavior in sustainability transitions and allows for deriving implications on how to facilitate reorientation processes.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data Availability

The data that has been used is confidential.

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References

- Ansari, S., Krop, P., 2012. Incumbent performance in the face of a radical innovation: towards a framework for incumbent challenger dynamics. *Res. Pol.* 41 (8), 1357–1374.
- Apajalahti, E.-L., Temmes, A., Lempiälä, T., 2018. Incumbent organisations shaping emerging technological fields: cases of solar photovoltaic and electric vehicle charging. *Technol. Anal. Strategic Manage.* 30 (1), 44–57.
- Berggren, C., Magnusson, T., Sushandoyo, D., 2015. Transition pathways revisited: established firms as multi-level actors in the heavy vehicle industry. *Res. Pol.* 44 (5), 1017–1028.

- Bögel, P. M., and Upham, P. (2018). Role of psychology in sociotechnical transitions studies: review in relation to consumption and technology acceptance. *Environmental Innovation and Societal Transitions*, 28, 122–136.
- Bourdieu, P., 1990. *The Logic of Practice*. Stanford University Press.
- Bourdieu, P., 1993. *The Field of Cultural Production: Essays on Art and Literature*. Columbia University Press.
- Burnes, B., 2004. Kurt Lewin and the planned approach to change: a re-appraisal. *J. Manage. Stud.* 41 (6), 977–1002.
- Burnes, B., Bargal, D., 2017. Kurt Lewin: 70 Years on. *J. Change Manage.* 17 (2), 91–100.
- Burnes, B., Cooke, B., 2013. Kurt Lewin's Field Theory: a review and re-evaluation. *Int. J. Manage. Rev.* 15 (4), 408–425.
- Crosby, G., 2021. *Planned Change. Why Kurt Lewin's Social Science is Still Best Practice for Business Results, Change Management, and Human Progress*. Routledge.
- de Haan, F.J., Rotmans, J., 2011. Patterns in transitions: Understanding complex chains of change. *Technol. Forecast Soc. Change* 78 (1), 90–102.
- de Haan, F.J., Rotmans, J., 2018. A proposed theoretical framework for actors in transformative change. *Technol. Forecast Soc. Change* 128, 275–286.
- de Vries, G., Biely, K., Chappin, E., 2021. Psychology: The missing link in transitions research. *Environ. Innov. Soc. Transit.* 41, 42–44.
- Duygan, M., Stauffacher, M., Meylan, G., 2019. A heuristic for conceptualizing and uncovering the determinants of agency in socio-technical transitions. *Environ. Innov. Soc. Transit.* 33, 13–29.
- Farla, J., Markard, J., Raven, R., Coenen, L., 2012. Sustainability transitions in the making: a closer look at actors, strategies and resources. *Technol. Forecast Soc. Change* 79 (6), 991–998.
- Fischer, L.-B., Newig, J., 2016. Importance of actors and agency in sustainability transitions: a systematic exploration of the literature. *Sustainability* 8 (5), 476.
- Fligstein, N., McAdam, D., 2011. Toward a general theory of strategic action fields. *Sociol. Theory* 29 (1), 1–26.
- Galeano Galvan, M., Cuppen, E., Taanman, M., 2020. Exploring incumbents' agency: Institutional work by grid operators in decentralized energy innovations. *Environ. Innov. Soc. Transit.* 37, 79–92.
- Geels, F.W., 2005. The dynamics of transitions in socio-technical systems: A multi-level analysis of the transition pathway from horse-drawn carriages to automobiles (1860-1930). *Technol. Anal. Strategic Manage.* 17 (4), 445–476.
- Geels, F.W., 2011. The multi-level perspective on sustainability transitions: Responses to seven criticisms. *Environ. Innov. Soc. Transit.* 1 (1), 24–40.
- Geels, F.W., 2014. Reconceptualising the co-evolution of firms-in-industries and their environments: Developing an inter-disciplinary Triple Embeddedness Framework. *Res. Pol.* 43 (2), 261–277.
- Geels, F.W., 2020. Micro-foundations of the multi-level perspective on socio-technical transitions: developing a multi-dimensional model of agency through crossovers between social constructivism, evolutionary economics and neo-institutional theory. *Technol. Forecast Soc. Change* 152, 119894.
- Geels, F.W., 2021. From leadership to followership: A suggestion for interdisciplinary theorising of mainstream actor reorientation in sustainability transitions. *Environ. Innov. Soc. Transit.* 41, 45–48.
- Geels, F.W., Schot, J., 2007. Typology of sociotechnical transition pathways. *Res. Pol.* 36 (3), 399–417.
- Giddens, A., 1984. *The Constitution of Society*. University of California Press.
- Heinze, K.L., Weber, K., 2016. Toward organizational pluralism: Institutional intrapreneurship in integrative medicine. *Organization Sci.* 27 (1), 157–172.
- Hill, C.W.L., Rothaermel, F.T., 2003. The performance of incumbent firms in the face of radical technological innovation. *Acad. Manage. Rev.* 28 (2), 257–274.
- Hoffman, A.J., 1999. *Institutional evolution and change: Environmentalism and the U.S. chemical industry*. *Acad. Manage. J.* 42 (4), 351–371.
- Hoffman, A.J., 2021. *The Engaged Scholar. Expanding the Impact of Academic Research in Today's World*. Stanford University Press.
- Huttunen, S., Kaljonen, M., Lonkila, A., Rantala, S., Rekola, A., Paloniemi, R., 2021. Pluralising agency to understand behaviour change in sustainability transitions. *Energy Res. Social Sci.* 76, 102067.
- Johnstone, P., Stirling, A., Sovacool, B., 2017. Policy mixes for incumbency: Exploring the destructive recreation of renewable energy, shale gas 'fracking,' and nuclear power in the United Kingdom. *Energy Res. Social Sci.* 33, 147–162.
- Köhler, J., Geels, F.W., Kern, F., Markard, J., Onsongo, E., Wiecezorek, A., Alkemede, F., Avelino, F., Bergeck, A., Boons, F., Fünfschilling, L., Hess, D., Holtz, G., Hyysalo, S., Jenkins, K., Kivimaa, P., Martiskainen, M., McMeekin, A., Mühlemeier, M.S., Wells, P., 2019. An agenda for sustainability transitions research: State of the art and future directions. *Environ. Innov. Soc. Transit.* 31, 1–32.
- Kump, B., 2021. When do threats mobilize managers for organizational change toward sustainability? An environmental belief model. *Bus. Strategy Environ.* 30, 2713–2726.
- Kungl, G., 2015. Stewards or sticklers for change? Incumbent energy providers and the politics of the German energy transition. *Energy Res. Social Sci.* 8, 13–23.
- Kungl, G., Geels, F.W., 2018. Sequence and alignment of external pressures in industry destabilisation: Understanding the downfall of incumbent utilities in the German energy transition (1998–2015). *Environ. Innov. Soc. Transit.* 26, 78–100.
- Kungl, G., Hess, D.J., 2021. Sustainability transitions and strategic action fields: A literature review and discussion. *Environ. Innov. Soc. Transit.* 38, 22–33.
- Lewin, K., 1939. Field theory and experiment in social psychology: Concepts and methods. *Am. J. Sociol.* 44 (6), 868–896.
- Lewin, K., 1943a. Defining the "field at a given time. *Psychol. Rev.* 50 (3), 292–310.
- Lewin, K., 1943b. Forces behind food habits and methods of change. *Bull. Nat. Res. Council* 108, 35–65.
- Lewin, K., 1946. Behavior and development as a function of the total situation. In: Carmichael, L. (Ed.), *Manual of child psychology*. John Wiley and Sons Inc, pp. 791–844.
- Lewin, K., 1947a. Frontiers in group dynamics: Concept, method and reality in social science; social equilibria and social change. *Hum. Epidemiol. Anim. Lab. Correl. Chem. Carcinog.* 1 (1), 5–41.
- Lewin, K., 1947b. Frontiers in group dynamics: II. Channels of group life; social planning and action research. *Hum. Epidemiol. Anim. Lab. Correl. Chem. Carcinog.* 1 (2), 143–153.
- Lewin, K., 1948. *Resolving Social Conflicts*. Harper and Brothers.
- Lewin, K., 1951. *Field theory in social science*. Harper and Row.
- Loorbach, D., Frantzeskaki, N., Avelino, F., 2017. Sustainability transitions research: Transforming science and practice for societal change. *Annu. Rev. Environ. Resour.* 42, 599–626.
- Markard, J., Raven, R., Truffer, B., 2012. Sustainability transitions: An emerging field of research and its prospects. *Res. Pol.* 41 (6), 955–967.
- Marrow, A.J., 1969. *The Practical Theorist: The Life and Work of Kurt Lewin*. Teachers College Press.
- Martiskainen, M., Sovacool, B.K., 2021. Mixed feelings: A review and research agenda for emotions in sustainability transitions, 40. *Environmental Innovation and Societal Transitions*, pp. 609–624.
- Mori, A., 2021. How do incumbent companies' heterogeneous responses affect sustainability transitions? Insights from China's major incumbent power generators. *Environ. Innov. Soc. Transit.* 39, 55–72.
- Schein, E.H., 1988. *Organizational Psychology*. Prentice Hall.
- Scott, W.R., 1995. *Institutions and Organizations*. SAGE Publications.
- Sovacool, B.K., Griffiths, S., 2020. The cultural barriers to a low-carbon future: A review of six mobility and energy transitions across 28 countries. *Renew. Sust. Energ. Rev.* 119, 109569 <https://doi.org/10.1016/j.rser.2019.109569>.
- Sovacool, B.K., Turnheim, B., Martiskainen, M., Brown, D., Kivimaa, P., 2020. Guides or gatekeepers? Incumbent-oriented transition intermediaries in a low-carbon era. *Energy Res. Social Sci.* 66, 101490.
- Steen, M., Weaver, T., 2017. Incumbents' diversification and cross-sectorial energy industry dynamics. *Res. Pol.* 46 (6), 1071–1086.
- Stirling, A., 2019. How deep is incumbency? A 'configuring fields' approach to redistributing and reorienting power in socio-material change. *Energy Res. Social Sci.* 58, 101239.
- Stouten, J., Rousseau, D.M., De Cremer, D., 2018. Successful organizational change: Integrating the management practice and scholarly literatures. *Acad. Manage. Ann.* 12 (2), 752–788.
- Strambach, S., Pflietsch, G., 2020. Transition topology: Capturing institutional dynamics in regional development paths to sustainability. *Res. Pol.* 49 (7), 104006.
- Swanson, D.J., Creed, A.S., 2014. Sharpening the focus of force field analysis. *J. Change Manage.* 14 (1), 28–47.

- Tolman, E., 1948. Kurt Lewin (1890–1947). *Psychol. Rev.* 55, 1–4.
- Turnheim, B., Geels, F.W., 2013. The destabilisation of existing regimes: Confronting a multi-dimensional framework with a case study of the British coal industry (1913-1967). *Res. Pol.* 42 (10), 1749–1767.
- Turnheim, B., Sovacool, B.K., 2020. Forever stuck in old ways? Pluralising incumbencies in sustainability transitions. *Environ. Innov. Soc. Transit.* 35, 180–184.
- Upham, P., Bögel, P., Dütschke, E., 2020. Thinking about individual actor-level perspectives in sociotechnical transitions: A comment on the transitions research agenda. *Environ. Innov. Soc. Transit.* 34, 341–343.
- Upham, P., Bögel, P., Klapper, R.G., Kasperova, E., 2021. Theorising individual agency within sociotechnical sustainability transitions frames: a social psychological review. In: Teerikangas, S., Onkila, T., Koistinen, K., Mäkelä, M. (Eds.), *Research handbook of sustainability agency*. Edward Elgar Publishing Ltd, pp. 29–45.
- van Mossel, A., van Rijnsoever, F.J., Hekkert, M.P., 2018. Navigators through the storm: A review of organization theories and the behavior of incumbent firms during transitions. *Environ. Innov. Soc. Transit.* 26, 44–63.
- Wooten, M., Hoffman, A.J., 2016. Organizational fields: Past, present and future. In: Greenwood, R., Oliver, C., Lawrence, T.B., Meyer, R.E. (Eds.), *The SAGE Handbook of Organizational Institutionalism*. SAGE Publications Ltd, pp. 55–74.
- Zolfagharian, M., Walrave, B., Raven, R., Romme, A.G.L., 2019. Studying transitions: Past, present, and future. *Res. Pol.* 48 (9), 103788.