

Survey

The study of institutional entrepreneurship and its implications for transition studies



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ABSTRACT

Innovations accompanying transitions often prompt institutional change if they do not match with existing institutions. Transition studies started to incorporate institutional dynamics into their research, but efforts hitherto remain underdeveloped. In this paper, we systematically review the institutional entrepreneurship literature. Based on a reading of 153 empirical cases, we identify trends and biases in the literature and we distil a number of insights for transition studies to engage with.

1. Introduction

Transitions towards a sustainable future often rely on innovation (Badi and Murtagh, 2019; Loorbach et al., 2010). The long-standing view on innovation holds that firms develop new processes, products and services and introduce these on a market in search for consumers (Schumpeter, 1934). With firms introducing novelties and consumers selecting upon them, this has been understood as an evolutionary process (Nelson and Winter, 1982). In some instances, however, innovators do not just aim to satisfy consumer needs, but also strive for institutional change. This is especially true for innovations of a more radical kind (Nelson, 1995; Zelizer, 1978). Radical innovations often do not resonate with existing norms and values and formal regulations may not even be in place (Garud et al., 2002; Kaplan and Tripsas, 2008). In order for such innovations to be perceived as legitimate and to diffuse widely, institutional change is pivotal.

In innovation, and more specifically in transition studies, our understanding of the interplay between innovation and institutions has remained underdeveloped. Even though the “*need to better conceptualise the role of institutions in innovation*” (Geels, 2004: 899) has been signaled, no systematic research program has emerged. This is not to say that scholars have not paid any attention to the effect of institutions on innovation. It is widely acknowledged that institutions affect the rate and direction of innovation (Edquist and Johnson, 1997). In particular, many studies look into the role of patents and trademarks in innovation (Hall and Harhoff, 2012), the effect of regulation on innovation (Blind, 2012), and the role of institutions in shaping university-industry collaboration (Etzkowitz, 2001).

When it comes to the study of the co-evolution of innovation and institutions though, there are fewer studies to report (Fuenfschilling and Truffer, 2016; Kukk et al., 2016; Pelzer et al., 2019; Smink et al., 2015; Sotarauta and Pulkkinen, 2011). Such studies generally draw on various concepts from neo-institutional theory, but in a rather unsynchronized manner. More systematic theorizing about the interplay between innovation and institutions is also hampered by the fragmented state of institutional theorizing itself, “*leading to a bewildering array of empirical accounts and theoretical claims*” (Micelotta et al., 2017: 2). This wide variety of concepts and frameworks within institutional literature makes it hard to apply its concepts in transition studies in a consistent and

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concise manner.

Nevertheless, we consider neo-institutional theory as key to further a systematic research agenda on transitions, innovation and institutions. In particular, we deem the advances made in conceptualizing institutional change as the key entry point into institutional theorizing for transition scholars. It allows us to study transitions and innovations as a process in which technological and institutional change are intertwined and co-evolve. The particular focus we chose here is on the theory of institutional entrepreneurship, where institutional entrepreneurship is defined as “activities of actors who have an interest in particular institutional arrangements and who leverage resources to create new institutions or to transform existing ones” (Maguire et al., 2004: 657). Institutional entrepreneurs are then organized actors – with sufficient resources – who identify possibilities for creating and transforming institutions (DiMaggio, 1988).

We focus on institutional entrepreneurship literature over other streams of literature within neo-institutional theory for three reasons. First, as (radical) innovations introduced during transitions often break with existing expectations, norms and regulations, innovators are prompted to actively change these institutions (Holloway, 2015; Salvetti and O’Toole, 2017), i.e. act as institutional entrepreneurs. In such settings, innovation does not only concern the introduction of a new process, product or service, but also the creation or modification of informal and formal institutions. The second motivation to focus on institutional entrepreneurship stems from its theoretical width and maturity. Scholars have moved from institutional entrepreneurship as a notion to demarcate certain actors and activities to a fully-fledged theory including process-related strategies and hypotheses concerning enabling conditions for institutional entrepreneurship to occur. Because of this institutional entrepreneurship theory also allows for comparative studies, for example comparing institutional entrepreneurship across different countries, which is also not uncommon in transition studies. Our third motivation is based on the compatibility of institutional entrepreneurship theory and the two main transition theories: technological innovation systems (Hekkert et al., 2007) and the multi-level perspective (Geels, 2002). By pointing to conditions both at the micro-level of actors and the macro-level of organizational fields, the theory of institutional entrepreneurship provides a theoretical complement to transition studies, which also studies how actors change institutions (Hekkert et al., 2007; Bergek et al., 2008) by describing the interplay between ‘agency’ and ‘structure’ (Fuenfschilling and Truffer, 2016). In particular, as we will argue below, the three levels that are distinguished in the multi-level perspective (niche, regime, landscape) map well onto the levels of institutional entrepreneurship, institutional fields, and exogenous jolts/crises as distinguished in institutional entrepreneurship theory (Battilana et al., 2009). This article thus aims to clarify the conceptual trading zones between institutional entrepreneurship and transitions literatures, an interface that has not yet received the focused attention it deserves.

This paper provides a systematic literature review of empirical studies on institutional entrepreneurship with the aim to learn how transition studies can be enriched by incorporating concepts and insights from institutional entrepreneurship literature. We do so in two steps. First, we review 140 articles describing 153 empirical cases of institutional entrepreneurship. To provide a general overview of the literature, we took note of trends and biases in terms of contextual characteristics of the empirical work which can be related to the characteristics of and biases in the empirical work of transition scholars. We then specifically focus on the evidence base, or lack thereof, for the hypotheses concerning the influence of enabling conditions put forward by Battilana et al. (2009) in an influential conceptual paper. Second, building on the first stage of analysis, we reflect on the consistencies between insights from institutional entrepreneurship and transition studies, and what transition studies can learn from the institutional entrepreneurship literature regarding the interplay between innovation and institutions. We identify lessons for transition scholars and relate these to widely used frameworks in the fields of innovation systems and sustainability transitions.

2. Institutional entrepreneurship

The main foundations of neo-institutional theory were first articulated in the late 1970s and early 1980s and – as a reaction to rational choice theories – revolved around the influence of institutional forces on organizational structure and change (DiMaggio and Powell, 1983; Meyer and Rowan, 1977; Zucker, 1977). The central concept has been ‘institutional isomorphism’, which is the process that forces organizations to become increasingly similar under the same set of environmental conditions (DiMaggio and Powell, 1983). Emphasizing the strong pressures for organizations to conform to shared expectations and norms within an organizational field, institutional change was attributed to exogenous shocks rather than the actions of actors themselves (Chen, 2013). Such structural determinism hardly appreciated the role of agency in institutional change.

DiMaggio (1988) then introduced the notion of ‘institutional entrepreneur’ as a means to reintroduce agency into institutional analysis. Institutional entrepreneurs create new systems of meaning by tying together the functioning of disparate sets of institutions (Garud et al., 2002) and constitute a force of change in institutional change processes. One of the key questions holds how certain actors are able to change institutions in spite of a natural tendency towards conformity and stasis (Holm, 1995; Seo and Creed, 2002). The notion of the institutional entrepreneur was quickly criticized as an explanation ‘Deus Ex Machina’ (Delmestri, 2006) depicting a ‘hyper-muscular’ agent (Fuenfschilling and Truffer, 2016: 299), reminiscent of the heroic inventor-entrepreneur central to the works of Schumpeter (1934) and Hughes (1987). It was argued that the notion of institutional entrepreneur merely attributed specific resources to institutional entrepreneurs without taking into account “the social interactions in which change is accomplished, which means including other actors and their influence on the course of the interaction as well as the reference group that assesses the appropriateness” (Meyer, 2006: 732), thus neglecting social structures and the multiple pathways for change they enable and constrain (Schneiberg and Lounsbury, 2008).

Later, a systematic literature review on institutional entrepreneurship by Leca et al. (2008) concluded that more recent research “accounts for actors’ institutional embeddedness and acknowledges the institutions’ role as both enablers of and constraints on action” (Leca et al., 2008: 5). At that time, studies started to move away from the heroic institutional entrepreneur with an overemphasis on

agency, towards embedded actors that cannot succeed on their own in initiating institutional change. They even identified one study (Khan et al., 2007) describing ‘anti-heroes’ as instigators of institutional change, albeit unintentionally. The intentionality of institutional entrepreneurs and the distribution of agency among multiple actors were identified as interesting topics for future research, as well as how these aspects are influenced over time (Leca et al., 2008). The review further showed that to account for embeddedness, the position of an institutional entrepreneur within a social environment is crucial (Battilana, 2006), as well as the ability of the institutional entrepreneur to combine diverse institutional logics (Leca and Naccache, 2006).

The review by Leca et al. (2008) led to arguably one of the most influential papers on institutional entrepreneurship to date, by Battilana et al. (2009), titled “*How actors change institutions: Towards a Theory of Institutional Entrepreneurship*”. The central challenge that the paper took up is to resolve the theoretical structure-agency debate by accounting for the embedded agency of institutional entrepreneurs. They do so by distinguishing between structural field-level conditions and actor characteristics, and by describing strategies of institutional entrepreneurs.

2.1. Field-level conditions

Battilana et al. (2009) describe a number of field-level conditions that influence institutional entrepreneurship. *Jolts and crises* describe events such as social upheaval, regulatory changes, technological disruption and competitive discontinuity that create room for new ideas as they disturb the existing field-level consensus (Child et al., 2007; Greenwood et al., 2002). In some cases, crises follow from acute field-level problems, such as scarcity of resources, which cause institutional entrepreneurs to mitigate to other fields (Durand and McGuire, 2005). The presence of multiple institutional orders within an organizational field, known as *heterogeneity*, is another trigger for institutional entrepreneurship (Clemens and Cook, 1999). In particular, contradicting orders create room for deviation and experimentation with new practices and reform proposals. Finally, the degree of *institutionalization* of an organizational field may matter. In general, institutional entrepreneurship will be harder in fields that are more institutionalized, as deviations from existing institutional orders, even if there are multiple of such orders, are more likely to be sanctioned by stakeholders. The degree of institutionalization is closely related to the maturity of the organizational field, where some scholars such as Leca et al. (2008) distinguish between emerging organizational fields (with a low degree of institutionalization) and mature organizational fields (with a high degree of institutionalization), reminiscent of the distinction between emerging and mature technologies in the context of innovation (Rotolo et al., 2015).

2.2. Actor characteristics

In addition to field-level conditions, Battilana et al. (2009) describe how actors’ *social position* may affect their capability to act as institutional entrepreneur. An actor in a theoretical sense can be an individual or an organization. An actor’s social position influences the extent to which they have access to specific resources (Lawrence, 1999) and the extent to which they are perceived as a legitimate agent of change in the eyes of others (Maguire et al., 2004). Furthermore, actors embedded within multiple fields simultaneously are more likely to become institutional entrepreneurs (Emirbayer and Mische, 1998; Sewell, 1992). They are more inclined to leverage institutional contradictions and understand alternative institutional orders, enabling them to transpose institutions from one field to another (Battilana et al., 2009). Social position also matters, because it might affect actors’ perceptions of a field. In particular, when an actor has a high *status* and a central social position within a field, it is less expected to deviate from the very institutions that structure an organizational field and grant the actor its central position. Peripheral, low-status actors by contrast have less to gain from holding on to established field-level institutions and are, generally speaking, less sanctioned when deviating from institutions. Hence, novel practices and institutions may emerge most often from the periphery. However, as also emphasized by Battilana et al. (2009), there are several examples where central actors took the lead in fostering institutional change enabled by access to resources and strong networks within the field.

2.3. Institutional entrepreneurship strategies

With the articulation of field-level conditions and actor characteristics, Battilana et al. (2009) developed a number of hypotheses regarding the likelihood of institutional entrepreneurship to occur and the type of actors engaging in institutional entrepreneurship. In addition to these ‘independent variables’ that explain the occurrence of institutional entrepreneurship as ‘dependent variable’, the authors also described the ‘how’, that is, the typical strategies that institutional entrepreneurs employ to foster institutional change.

Implementation of change can be distilled into three main steps: i) developing and articulating a vision, ii) mobilizing allies to support that vision and iii) motivating them to achieve and sustain the vision (Armenakis and Bedeian, 1999; Battilana et al., 2009; Kanter et al., 1992). Battilana et al. (2009) further conceptualized the first two steps in their paper and applied it to the notion of institutional entrepreneurship.

The first step, developing and articulating a vision for divergent change, inherently poses a challenge as this divergent vision tends to break with institutionalized practices and beliefs within a field. Framing tactics, described in the social movements literature (e.g. Rao et al., 2000), have been identified as an important tool for institutional entrepreneurs. Three different forms of framing are proposed: *diagnostic* (which problem will the institutional change solve?), *prognostic* (does the change lead to better institutional arrangements?) and *motivational* framing (which compelling motivations spur the institutional change?) (Benford and Snow, 2000; Markowitz, 2007). More in general terms, a vision can be considered as an “*imaginative engagement of the future*” (Emirbayer and Mische, 1998). Effective institutional entrepreneurs are sensitive to the discursive and cultural contexts within which they are

embedded and are able to draw selectively from this context when framing their vision (Battilana et al., 2009; Fligstein, 1997). To remain effective as a motivational force, then, a vision needs to be followed up by practical actions (Battilana and D’Aunno, 2009).

The second step concerns mobilizing followers. Without the support of followers and cultivation of collaboration and allies, institutionalization cannot take place (Fligstein, 2001; Greenwood et al., 2002). The use of *rhetorical strategies* and the *assemblage of resources* that induce endorsement of change are described as the main tools to achieve the mobilization of followers (Battilana et al., 2009). Rhetorical strategies revolve around effectively advocating the need for change while simultaneously relating the innovation to existing cognitive or organizational templates (Suddaby and Greenwood, 2005). *Analogies* may be used to legitimize a divergent vision (Hargadon and Douglas, 2001) and *storytelling*, including the identification of heroes, villains and reinterpretations of existing symbolic stories in an organizational field, plays an important part in conveying the divergent vision to the audience (Meyer and Rowan, 1977; Zilber, 2007). These stories should then be *theorized* by the institutional entrepreneurs, meaning a translation of the story into more general and rationalized terms, addressing a wider audience of potential adopters (Greenwood et al., 2002). The most important resources that induce endorsement of change are *financial resources* as well as resources related to an institutional entrepreneur’s social position: *formal authority* and *social capital*. An actor can gain formal authority by increasing the perceived legitimacy of their own right to make decisions. Such increased authority can then help to legitimize divergent change (Maguire et al., 2004; Phillips et al., 2000). An actor’s social capital entails their informal network position. Social relations can decrease or increase an institutional entrepreneurs’ access to resources such as knowledge and political support (Battilana et al., 2009), thus successful institutional entrepreneurs may benefit from networking and building social relations with important actors in a field.

Strategies in the process of institutional change show resemblances with the literature on institutional work. Lawrence and Suddaby (2006) proposed a set of twelve types of activities that can all be considered as part of institutional work, related to creating, maintaining and disrupting institutions. Later, Pacheco et al. (2010) compressed these activities into five strategies of institutional work related to creating or disrupting institutions: framing, theorizing, collaborating, lobbying and negotiating. These five steps resemble the two steps followed by institutional entrepreneurs according to Battilana et al. (2009): to develop a vision (encompassing framing and theorizing) and mobilizing allies (encompassing collaborating, lobbying and negotiating). What institutional work studies add to the study of institutional change is the analysis of actors that actively defend and maintain current institutions. In this respect, the institutional work framework fits well with transition studies taking into account the strategies of both challengers and incumbents, and their interplay.

3. Data

Building on these theoretical insights, we were able to create a coding system to guide us in conducting a systematic literature review of articles describing empirical cases of institutional entrepreneurship published after the article of Battilana et al. (2009). This article provides a recognized benchmark in the literature (with 717 citations in Web of Science in October 2019, it is the best cited article on institutional entrepreneurship after 2006). Fig. 1 clearly shows that the frequency of publications on the topic of institutional entrepreneurship has rapidly grown especially after 2009, which illustrates the growing interest in the topic and is indicative that Battilana and co-authors were among the pioneers of this field of research.

3.1. Data collection

We used *Web of Science* to search for articles published in peer-reviewed journals. This formal search strategy of researching electronic databases has become the main strategy to perform systematic literature reviews (Kitchenham, 2004). We performed a topic search using the keyword “*institutional entrepreneurship*”. We did not apply synonyms for “institutional entrepreneurship”, even if some scholars may describe similar agents in different terms, such as “institutional change agent”. We chose to do so, because we were interested to review the institutional entrepreneurship literature specifically and moreover because we did not expect many studies on institutional entrepreneurship as understood in the same vein as neo-institutional theory under a different terminology due

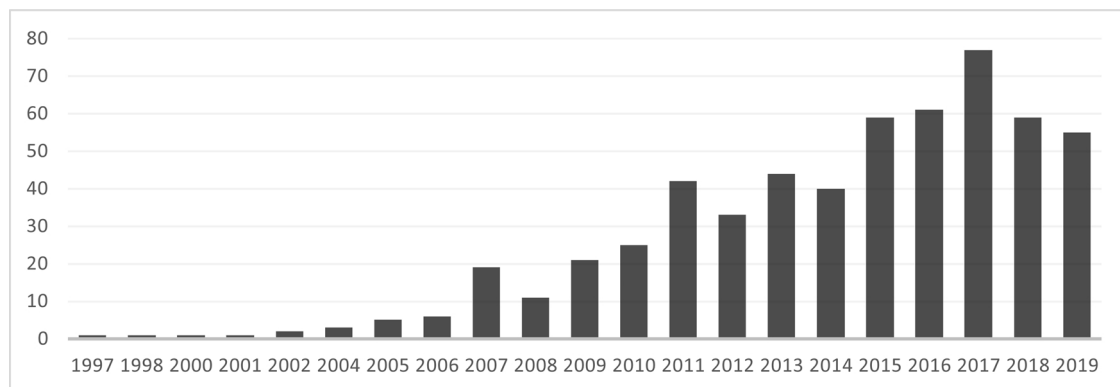


Fig. 1. Published items in each year (source: Web of Science analysis, October 2019).

Table 1
Journals with most articles on Institutional Entrepreneurship.

Journal	No. articles
ORGANIZATION STUDIES	24
JOURNAL OF BUSINESS VENTURING	13
JOURNAL OF BUSINESS ETHICS	12
JOURNAL OF MANAGEMENT STUDIES	12
ORGANIZATION SCIENCE	12
RESEARCH POLICY	12
ACADEMY OF MANAGEMENT JOURNAL	11
JOURNAL OF CLEANER PRODUCTION	11
TECHNOLOGICAL FORECASTING AND SOCIAL CHANGE	8
ACADEMY OF MANAGEMENT ANNALS	7

to the specificity of the term.

The topic search resulted in 552 articles. All articles contained the term ‘institutional entrepreneurship’ in one or more of the following sections: title, abstract, the keywords provided by the author and the keywords plus section (an algorithm that provides expanded terms stemming from the article’s cited references). Using this approach we aimed to include all articles building their empirical analyses on institutional entrepreneurship theory (referencing the Battilana et al. (2009) article or not), which would be difficult to achieve without explicitly mentioning it.

We then selected all articles published starting from 2010 up until June 2019, leaving us with 481 articles. These articles originated from a variety of scientific fields and were thus featured in diverse scientific journals as is visible in Table 1. *Organization Studies*, with 24 articles constitutes the largest data source as institutional entrepreneurship is a popular topic within organizational science. It is noteworthy that two flagship journals in the field of innovation and transition studies (Research Policy, Technological Forecasting and Social Change) also appear as top-10 journals.

We then excluded all articles that were written in another language than English or that only briefly mentioned institutional entrepreneurship without describing an empirical case. Additionally, we excluded conceptual papers lacking thorough empirical evidence (e.g. enumerating examples of institutional entrepreneurship without discussing them more in-depth), book reviews, working papers and editorials. Lastly, we excluded those articles that merely mentioned institutional entrepreneurship and described an empirical case, but used alternative theoretical concepts as the main basis of their empirical analysis. Examples of such alternative theoretical concepts and accompanying references are: ‘social entrepreneurship’ (Dacin et al., 2010; Ebrashi and Darrag, 2017; McMullen, 2018; Tate and Bals, 2018), ‘sustainable entrepreneurship’ (Schaltegger and Wagner (2011)), ‘social intrapreneurship’ (Kistruck and Beamish, 2010), ‘system-level entrepreneurs’ (Isaksen et al., 2018) and ‘place-based leadership’ (Hu and Hassink, 2017).

The final dataset consisted of 140 articles covering 153 cases, as some articles compared two or three cases in-depth¹. Fig. 2 shows an increasing trend in articles in our dataset citing Battilana et al. (2009), indicating the rising prominence of the Battilana-theory on institutional entrepreneurship.

3.2. Coding

We reviewed the 140 articles coding the content along two categories (Table 2). First, we used a number of descriptive codes to classify the empirical cases. These codes allowed us to identify trends in empirical studies to relate them to empirical work in transition studies. First, we looked at the type of institutional entrepreneur, specifically if there was an emphasis on the agency of firms as we see in innovation studies (Block et al., 2017). We further coded if the process described was a case of success or failure, to see if there still is a bias towards success stories as noted previously (Khan et al., 2007; Su et al., 2017). Finally, we coded some case characteristics common in transition studies, including whether the case was related to a technological or non-technological innovation, situated in a manufacturing or service sector context, in a public or private sector context, and in a low-income or high-income country context.

The second and main category of variables is based on institutional entrepreneurship theory as presented in the previous section, specifically leaning on the theory as outlined by Battilana et al. (2009). Here, we coded whether field-level conditions were mentioned (jolts or crises, high or low heterogeneity, high or low institutionalization). We also looked at actor characteristics, in particular if the social position of the institutional entrepreneur was described as high-status or low-status, and as central or peripheral in the field. Finally, concerning institutional entrepreneurship strategies, we created two codes: whether or not an article described the formulation of a vision and the mobilization of allies. This second coding category was used to identify the theoretical strengths and/or weaknesses in the literature that could provide valuable lessons for transition scholars.

Whenever there was no mentioning of a concept in the respective article, or when they were unable to be classified in a binary fashion, missing values were entered. The coding protocol is attached as an appendix.

We analyzed the dataset by counting frequencies of codes and plotting them in timelines. Lastly, overall emerging trends and

¹ The dataset with accompanying codes can be found as a supplement here: doi:10.24416/UU01-NJUT31

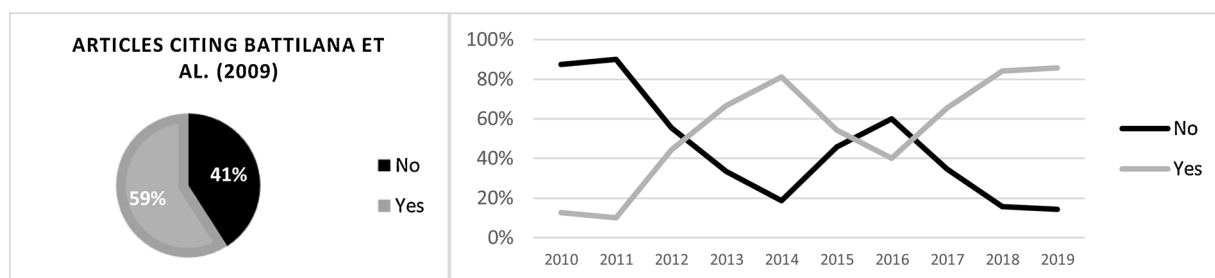


Fig. 2. Frequencies of articles citing Battilana et al. (2009), in total and over time.

Table 2

Overview of main concepts and codes.

Coding category	Concept	Code
Descriptive codes	Type of institutional entrepreneur	Firm(s), firm(s) + other(s), other(s)
	Outcome	Success, Failure
	Type of innovation	Technological, Non-technological
	Sector	Manufacturing, Services
	Sector	Private, Public
Theory codes	Geography	High-income, Low-income
	Jolts or crises	Yes, No
	Heterogeneity	High, Low
	Institutionalization	High, Low
	Status	High, Low
	Social position	Central, Peripheral
	Formulating a vision	Yes, No
	Mobilizing allies	Yes, No

concepts within the literature that stood out during the coding process have been recorded as general notes. We did this to search for novel theoretical developments in the literature.

4. Results

4.1. Descriptive codes

Our descriptive codes allowed us to map the empirical contexts in which the institutional entrepreneurship framework has been applied. Regarding the actors, an emphasis on firms was not apparent. Only 31 % of studies exclusively dealt with firms as institutional entrepreneurs, 24 % with a collective of actors that included at least one firm, and another 45 % with an organization other than a firm. Recurring examples within the non-firm category were governments/regulatory agencies ($n = 18$), NGOs ($n = 8$), universities ($n = 3$) and individuals ($n = 46$) such as academics, activists, inventors or celebrities. It shows that the phenomenon of institutional entrepreneurship is very broad in terms of the kinds of actor(s) initiating it, avoiding the firm-bias that is present within innovation studies (Block et al., 2017).

We further looked at five other descriptive characteristics of institutional entrepreneurship shown in Fig. 3(a–e). Out of all 153 observations, no less than 87 % of the cases dealt with successful institutional entrepreneurship. Thus, despite calls for more research on failed institutional entrepreneurship (Battilana et al., 2009; Khan et al., 2007; Su et al., 2017; Weik, 2011), the time trend shows that this bias towards success stories has not decreased in the past decade. To identify what is known about failure cases in the literature so far, we go into the failure cases more in-depth in section 5.

When looking at types of innovations, we observed that there were many more cases describing non-technological innovations (70 %) than technological innovations (27 %) (Fig. 3b). Interestingly, the main foci within the studies on technological innovation were sustainable technologies related to sustainability transitions (Markard et al., 2012), in particular renewable energy sources ($n = 19$), and healthcare-related technologies ($n = 15$). Information technology ($n = 5$) and urban (water) management and planning sector studies ($n = 3$) received less attention.

Turning to sectoral characteristics, we observed a slight bias towards service sectors (41 %) as opposed to manufacturing sectors (30 %) (Fig. 3c), quite opposite to the field of innovation studies where service innovation is still a rather small sub-field (Martin, 2016). We also observed a slight bias towards private sectors, although attention to the public sector has been growing (Fig. 3d). Interestingly, many missing values comprise empirical cases that deal with public-private collaborations.

Finally, the literature was clearly skewed towards high income countries (Fig. 3e). A similar bias has been observed in the technological innovation systems literature (Bergek et al., 2015; Fuenfschilling and Truffer, 2016). Missing (few) values here are studies located in both low and high income countries, or those focusing on a global scale.

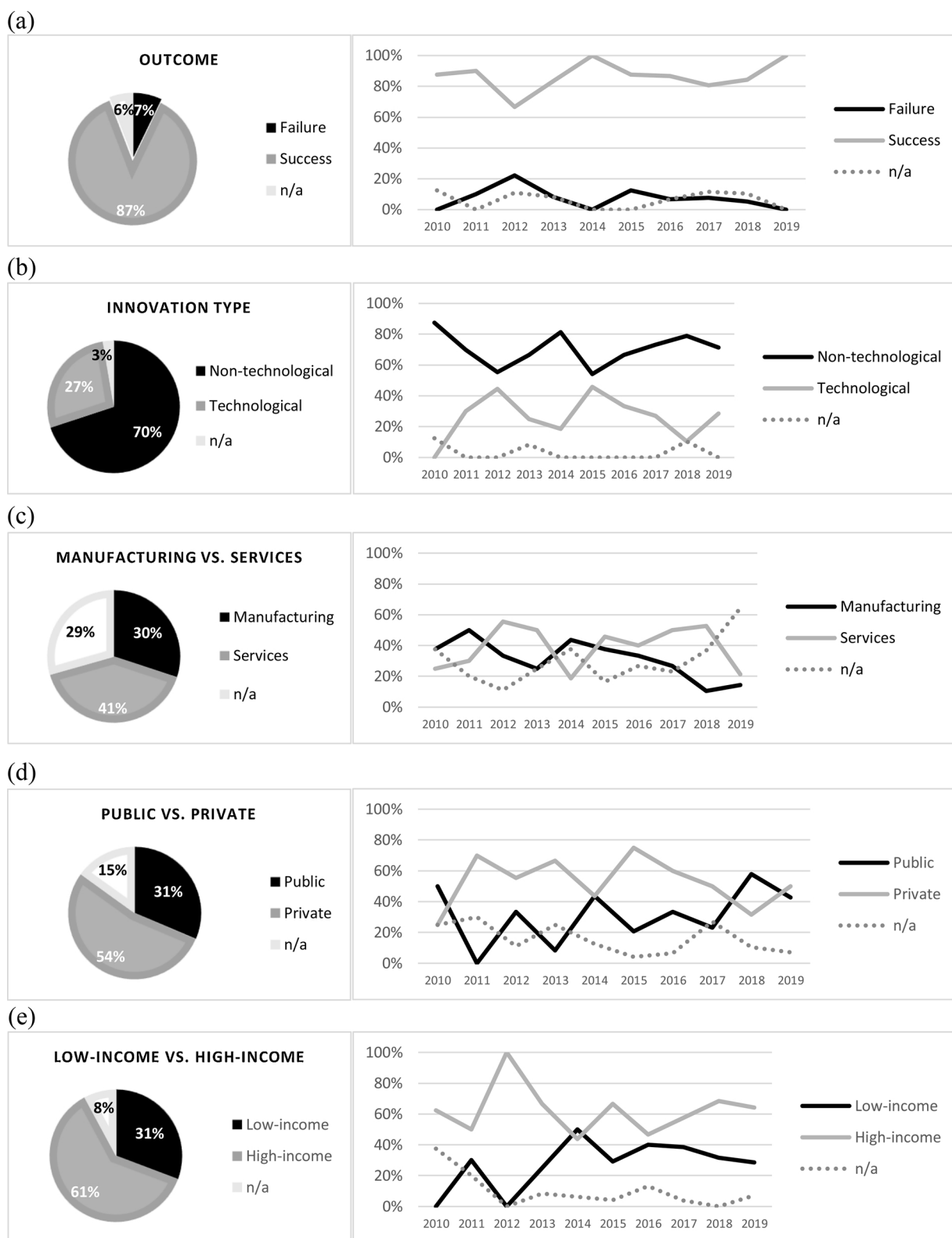


Fig. 3. a) Frequencies of described IE cases that were successful or failed, in total and over time. b) Frequencies of technological and non-technological innovation types, in total and over time. c) Frequencies of manufacturing and services sectors, in total and over time. d) Frequencies of public and private sectors, in total and over time. e) Frequencies of low-income and high-income national contexts, in total and over time.

4.2. Theory codes

The coding of field-level conditions and actor characteristics helped us to systematically review the literature and identify the progress that has been made in applying the theory to a variety of cases. It also provided indications as to which theoretical aspects have been guiding most of the empirical research program that has been unfolding over the past decade.

Starting with three field-level conditions (4a-c), we observed that the majority of articles (61 %) did not mention a specific jolt or crisis, neither implicitly nor explicitly. Over time, however, this percentage has grown (see Fig. 4a). Hence, we can conclude that inclusion of jolts and crises in the institutional entrepreneurship theory has started to become helpful in the analysis of many cases. Looking at field-level heterogeneity, we found that 58 % of the cases concerned fields with a high degree of heterogeneity, as opposed to 22 % with a low degree. It should be noted that field-level heterogeneity was not always mentioned explicitly, but in cases where authors mentioned multiple institutional orders within a field, it was coded accordingly. As a third field-level condition enabling institutional entrepreneurship, we looked at the degree of institutionalization of an organizational field. We found that the majority, 59 % of cases, described fields with a high degree of institutionalization, as opposed to 27 % describing fields characterized by a low degree of institutionalization. This finding runs somewhat counter to the theory, which predicts that institutional entrepreneurship occurs more often in fields that are to a lesser extent institutionalized. At the same time, it may reflect the common interest of researchers to understand how institutional entrepreneurship can emerge in spite of a high degree of institutionalization, as is generally the case in sectors like health, energy and transport. Indeed, this is largely the empirical context where transition studies and neo-institutional theory intersect, in particular, within the field of sustainability transitions.

Turning to the actor characteristics in terms of status and centrality (Fig. 4d-e), we observed a relatively high number of missing values (53 % and 48 %). The many missing cases on micro-level attributes of institutional entrepreneurship seem to suggest that actor characteristics have not played a guiding role in the empirical research program. For the studies taking actor characteristics into account, the results did not point to a particular pattern, although we saw slightly more cases where the actor had a high status and occupied a central position in the organizational field. Moreover, for social position, 16 cases were coded as missing as the actors were embedded in multiple fields with differing social positions.

Finally, we looked at strategies employed by institutional entrepreneurs, in particular, whether they formulated a vision and mobilized allies. Fig. 5 clearly shows that the strategy part of the Battilana framework proved very helpful: 98 % of cases went into the processes of visioning and 86 % of cases covered mobilizing allies.

The reason why the percentage for mobilizing allies is somewhat lower than for visioning is that some papers chose to focus specifically on framing strategies (e.g. Morrison, 2017; Righettini and Sbalchiero, 2017) or described a failed attempt of institutional entrepreneurship (e.g. Kahl et al., 2012; Major et al., 2018), and did not discuss the next steps in the institutional change process.

4.3. General conclusion

From our systematic review of the post-2009 literature on institutional entrepreneurship, we can draw two general conclusions. First, it is clear that the notion of institutional entrepreneurship is very widely applicable. The empirical cases to which it has been applied vary in the actors acting as institutional entrepreneurs, as well as in technological, sectoral and geographical contexts. Its wide applicability is a strength of the theory, but in some cases also poses a threat of ‘over-use’ of certain theoretical concepts. For example, some of the cases we studied described processes of institutional change within a single organization/company (Heinze and Weber, 2015; Spitzmueller, 2018; Tumbas et al., 2018; Whittle et al., 2011). This micro-level focus raises the question whether institutional entrepreneurship theory as posed by Battilana et al. (2009) provides the most applicable theoretical handhelds to describe change processes occurring inside a single organization, given that the enabling conditions are described on the level of an organizational field. The wide applicability of the notion of institutional entrepreneurship across technological, sectoral and geographical contexts also calls for further theorizing about contextual specificities. For example, institutional change in the public sector may generally follow different pathways than in the private sector, or than in sectors where both public and private logics are intertwined (Fuenfschilling and Truffer, 2016).

Second, from the analysis of the theory codes, we can conclude that few studies consistently applied the theory of Battilana et al. (2009) in analyzing both field-level conditions and actor characteristics. Only 51 out of 153 cases contained no missing data when it came to our five theory codes, while it should again be noted that in some of these cases the theoretical concepts were not even explicitly mentioned. Thus, in the empirical tradition of institutional entrepreneurship studies, most selectively focus on particular conditions or actor characteristics, while ignoring others. As a result, the vast number of empirical cases did not lead to a systematic accumulation of evidence supporting or disproving particular aspects of the theory. However, one field-level condition stood out as important: in the majority of studies, it was found that heterogeneity in institutional orders within a field was conducive for institutional entrepreneurship. Actor characteristics were less consistently elaborated upon, but there was still attention paid to either social position, status or both in over half of the articles.

When it comes to the analysis of institutional entrepreneurship strategies that institutional entrepreneurs apply, the cases were much more consistent in the application of theory. Almost all studies looked at how actors created visions and frames, and subsequently mobilized actors and resources to sustain this vision. This indicates that the literature has developed in a way that scholars focus mainly on the *process* of institutional entrepreneurship as opposed to the enabling *conditions* for institutional entrepreneurship to occur. This observation is consistent with the growing importance of the related notion of institutional work in more empirical studies on institutional change, which further elaborates on the process and strategies involved in institutional change.

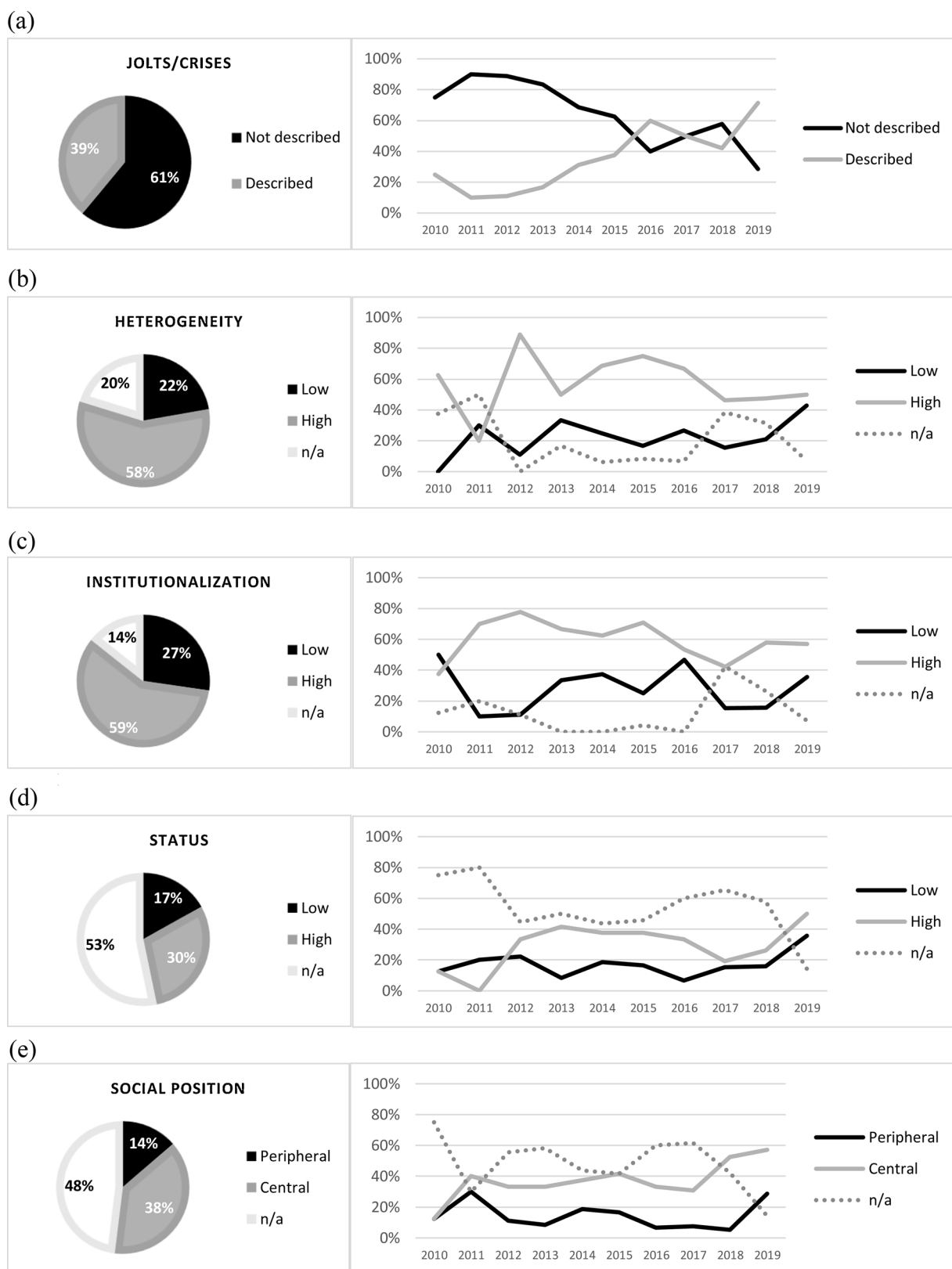


Fig. 4. a) Frequencies of the description of jolts and crises, in total and over time. b) Frequencies of degree of heterogeneity, in total and over time. c) Frequencies of degree of institutionalization, in total and over time. d) Frequencies of low vs. high status actors, in total and over time. e) Frequencies of peripheral vs. central position, in total and over time.

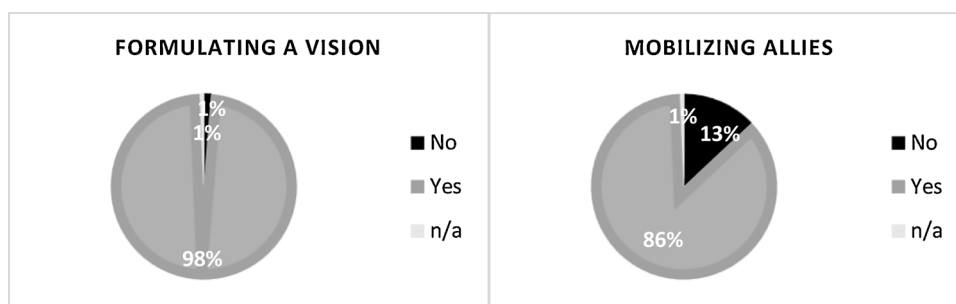


Fig. 5. Frequencies of IE strategies.

5. A closer look at failures

Looking at the number of cases of successful versus failed institutional entrepreneurship in Fig. 4a, we observed that the bias towards success stories has continued in the literature after 2009. This clear bias towards success stories leads to a lack of insights into why institutional entrepreneurship might fail. Hence, we were interested to examine those studies that in fact did research failure. In Table 3, we take a closer look at the 11 identified failure cases and determine the described reasons of failure as well as how our theory codes were coded in these cases.

The table shows that accounts of failed institutional entrepreneurship are related to a variety of factors from which no clear pattern emerges. When we try to detect patterns in the few examples of failed processes, it seems that articles #1 and #2 describe reasons for failure that are related to unfavorable actor characteristics of the institutional entrepreneur, in the shape of an unfavorable social position and lack of structural legitimacy respectively.

Articles #3, #5, #7, #8, and #9 highlight unfavorable field-level characteristics, including a centralized audience, strict regulations, unfit policies and unfavorable social structures in a field. Article #6 describes the lack of effective strategies employed by the institutional entrepreneur as the main reason for failure. Article #11 provides an example of an exogenous influence, which would be comparable to a jolt, that caused failure. In articles #4 and #10 the reason for failure remains unspecified, likely both actor and field-level characteristics were not conducive for institutional entrepreneurship.

The lack of a clear pattern either indicates a lack of consistent adoption and application of theoretical concepts of institutional entrepreneurship theory explaining failure, e.g. a degree of institutionalization too high to overcome or an unfavorable social position of an institutional entrepreneur. It may also show that the theory, thus far, does not provide clear handholds to analytically understand reasons for failure. In support of the latter argument, it should be reminded that the framework of Battilana et al. (2009) deals with *enabling* field-level conditions and actor characteristics for institutional entrepreneurship to emerge, which logically does not imply that failure is to be explained by the absence of such conditions (Kahl et al., 2012). One can think of a host of forces that cause institutional entrepreneurship to fail quite unrelated to field-level conditions and actor characteristics, including incumbent actors successfully resisting institutional change, unintended negative consequences of new institutions or a lack of legitimacy for new institutions among key stakeholders.

The evident diversity in the described reasons for failure is conceptually in line with the theoretical framework proposed by Battilana et al. (2009) in that some studies point to field-level conditions and others to actor characteristics. However, in multiple cases, the explanation of failure rests on factors that were not part of the original theory. This suggests that the theory explaining why institutional entrepreneurship is successful, needs to be supplemented with another theory of why it fails.

6. Emerging themes

From the review, we further distilled two emerging themes. First, in addition to classic single case studies, we witnessed a number of systematic comparative case studies, also called for in the original article by the Battilana et al. (2009). From the 140 articles, 11 concern comparative cases comparing in total 24 cases (which is why we have a total of 153 cases from 140 articles). Table 4 provides an overview of the comparative case studies, the nature of the comparisons made in these studies and how the theory codes were coded for all compared cases.

Articles #1, #4, and #5 present comparisons between institutional entrepreneurship processes revolving around different technologies or sectors. Interestingly, #1 and #5 do so by explicitly comparing successful technologies or companies to their failed counterparts. Articles #3, #7, #9, and #10 compare multiple national contexts, i.e. the comparison of national government systems in the UK and Japan (#3), business contexts around cricket in India and Australia (#7), blood cord policies in the U.S. and Canada (#9), and the wind energy sectors in Finland and India (#10). Two of these (#7 and 10) showcase a comparison between a low-income and high-income country. Article #11 makes a comparison between two regions in a low-income country context. Finally, article #2 compares how different types of legitimacy enable or constrain institutional entrepreneurs, essentially focusing on actor characteristics. Articles #6 and #8 do the same by respectively comparing the efforts and functioning of two governmental projects on multiple accounts and early and late entrants in China's private solar photovoltaic field. Articles #1, 2, 5, 7, 9, and 11 all include comparisons between successful and failed efforts.

Table 3

Overview of described cases of failed institutional entrepreneurship.

#	Title	Author and year	Case	Described reason(s) for failure	Theory codes
1	Agency in national innovation systems: Institutional entrepreneurship and the professionalization of Taiwanese IT	Hung & Whittington, 2011	Hard disk drives	Unfavorable social position and technological knowledge of firm leaders, conflicts of interest among allies/industry partners	Jolt(s): No Heterogeneity: Low Institutionalization: High Status: n/a Social position: peripheral
2	The role of institutional entrepreneurs in reforming healthcare	Lockett et al., 2012	New pathways for cancer genetic services within the English National Health Service	Lack of structural legitimacy of institutional entrepreneur	Jolt(s): No Heterogeneity: High Institutionalization: High Status: Low Social position: Low
3	Audience Structure and the Failure of Institutional Entrepreneurship	Kahl et al., 2012	Edmund Berkeley's efforts to legitimize the notion of computers as "Giant Brains"	Unfit audience structure (being too centralized), despite high status and legitimacy of institutional entrepreneur	Jolt(s): No Heterogeneity: High Institutionalization: n/a Status: High Social position: Central
4	Institutional entrepreneurship in North American lightning protection standards: Rhetorical history and unintended consequences of failure	McGaughey, 2013	North American lightning protection standards	Institutional entrepreneurs were not able to convince committees to pass the proposed standard – not specified further	Jolt(s): No Heterogeneity: n/a Institutionalization: High Status: n/a Social position: n/a
5	Entrepreneurship in regulated markets: framing contests and collective action to introduce pay TV in the U.S.	Gurses & Ozcan., 2015	Introduction of pay TV in the U.S. by OTA tv	Company was under strict regulations (and its competitor operated in a regulatory void following technological innovation)	Jolt(s): No Heterogeneity: High Institutionalization: High Status: High Social position: Central
6	Microfoundations of institutional change: Contrasting institutional sabotage to entrepreneurship	Lakshman and Akhter, 2015	Changes in the business context of sports (cricket) in India	A relative weakness of discursive strategies of the 'disruptor'	Jolt(s): No Heterogeneity: High Institutionalization: High Status: n/a Social position: n/a
7	Filling the Institutional Void in Rural Land Markets in Southern China: Is there Room for Spontaneous Change from Below?	Yep, 2015	The Nanhai land-based shareholding cooperative experiment in southern China	An ineffective monitoring mechanism, growing conflict over the allocation of returns, a changing social landscape, pecuniary temptation, ad hoc nature of the experiment	Jolt(s): Yes Heterogeneity: High Institutionalization: Low Status: Low Social position: Peripheral
8	Institutional Knots: A Comparative Analysis of Cord Blood Policy in Canada and the United States	Denburg, 2016	Cord blood policies in Canada	Formal governmental structure and the legacy of past policies	Jolt(s): No Heterogeneity: n/a Institutionalization: High Status: High Social position: Central
9	Role of institutional entrepreneurship in the creation of regional solar PV energy markets: Contrasting developments in Gujarat and West Bengal	Jolly, 2017	Solar PV energy market in West Bengal	Lack of organizations to reduce implementation barriers	Jolt(s): Yes Heterogeneity: n/a Institutionalization: High Status: n/a Social position: n/a
10	The absence of institutional entrepreneurship in climate adaptation policy—in search of local adaptation strategies for Rotterdam's unembanked areas	Duijn & van Buuren, 2017	Alternative, adaptive flood risk strategies for flood proofing the unembanked area of the north-end of the city district Feijenoord in Rotterdam	None of the involved actors was willing nor capable of undertaking entrepreneurial activities to start redesign	Jolt(s): Yes Heterogeneity: High Institutionalization: High Status: n/a Social position: n/a
11	When institutional entrepreneurship failed: The case of a responsibility center in a Portuguese hospital	Major et al., 2018	Introduction of a responsibility center in a cardiothoracic surgery service	Change introduced by exogenous political economic events that structured organizational circuits of power	Jolt(s): Yes Heterogeneity: n/a Institutionalization: High Status: n/a Social position: Central

Table 4

An overview of comparative case studies in our dataset.

#	Title	Author and year	Case	What is compared?	Theory codes
1	Agency in national innovation systems: Institutional entrepreneurship and the professionalization of Taiwanese IT	Hung & Whittington, 2011	PCs, semiconductors and hard disk drives	Three technologies of which two were successful (PCs and semiconductors) and one was not (hard disk drives)	<p>PC case: Jolt(s): No Heterogeneity: Low Institutionalization: High Status: n/a Social position: Central</p> <p>Semiconductors case: Jolt(s): No Heterogeneity: Low Institutionalization: High Status: n/a Social position: Central</p> <p>Hard disk drive case: Jolt(s): No Heterogeneity: Low Institutionalization: High Status: n/a Social position: Peripheral</p>
2	The role of institutional entrepreneurs in reforming healthcare	Lockett et al., 2012	New pathways for cancer genetic services within the English National Health Service	The type of legitimacy of institutional entrepreneurs, being either normative or structural	<p>Structural legitimacy case: Jolt(s): No Heterogeneity: High Institutionalization: High Status: High Social position: Central</p> <p>Normative legitimacy case: Jolt(s): No Heterogeneity: High Institutionalization: High Status: Low Social position: Peripheral</p>
3	Government as Institutional Entrepreneur: Extending Working Life in the UK and Japan	Flynn et al., 2014	Change in the organizational management of older workers in the UK and Japan	National government systems in the UK vs. Japan	<p>UK case: Jolt(s): No Heterogeneity: High Institutionalization: Low Status: High Social position: Central</p> <p>Japan case: Jolt(s): No Heterogeneity: Low Institutionalization: High Status: High Social position: Central</p>
4	Agricultural innovation platforms in West Africa How does strategic institutional entrepreneurship unfold in different value chain contexts?	Van Paassen et al., 2014	Agricultural innovation platforms in West Africa	Different products/value chains: Cocoa, cotton and palm oil	<p>Cocoa case: Jolt(s): No Heterogeneity: Low Institutionalization: High Status: n/a Social position: n/a</p> <p>Cotton case: Jolt(s): Yes Heterogeneity: High Institutionalization: High Status: n/a Social position: n/a</p> <p>Palmoil case:</p>

(continued on next page)

Table 4 (continued)

#	Title	Author and year	Case	What is compared?	Theory codes
5	Entrepreneurship in regulated markets: framing contests and collective action to introduce pay TV in the U.S.	Gurses & Ozcan., 2015	Pay TV in the U.S.	Two companies with different technologies, one that was successful (cable tv) and one that failed (OTA tv)	Jolt(s): No Heterogeneity: Low Institutionalization: Low Status: n/a Social position: n/a Cable tv case: Jolt(s): No Heterogeneity: High Institutionalization: High Status: Low Social position: Peripheral OTA tv case: Jolt(s): No Heterogeneity: High Institutionalization: High Status: High Social position: Central AP case: Jolt(s): Yes Heterogeneity: High Institutionalization: High Status: n/a Social position: Central GN case: Jolt(s): Yes Heterogeneity: High Institutionalization: High Status: n/a Social position: Central Australia case: Jolt(s): No Heterogeneity: High Institutionalization: Low Status: n/a Social position: n/a India case: Jolt(s): No Heterogeneity: High Institutionalization: High Status: n/a Social position: n/a Early entrants case: Jolt(s): Yes Heterogeneity: Low Institutionalization: Low Status: Low Social position: Peripheral Late entrants case: Jolt(s): Yes Heterogeneity: Low Institutionalization: High Status: n/a Social position: n/a US case: Jolt(s): No Heterogeneity: High Institutionalization: Low Status: High
6	Inertia and change related to sustainability - An institutional approach	Stål, 2015	Greenhouse gas reduction in the Swedish agricultural field	The efforts of two Swedish projects (AP & GN)	Jolt(s): Yes Heterogeneity: High Institutionalization: High Status: n/a Social position: Central GN case: Jolt(s): Yes Heterogeneity: High Institutionalization: High Status: n/a Social position: Central Australia case: Jolt(s): No Heterogeneity: High Institutionalization: Low Status: n/a Social position: n/a India case: Jolt(s): No Heterogeneity: High Institutionalization: High Status: n/a Social position: n/a Early entrants case: Jolt(s): Yes Heterogeneity: Low Institutionalization: Low Status: Low Social position: Peripheral Late entrants case: Jolt(s): Yes Heterogeneity: Low Institutionalization: High Status: n/a Social position: n/a US case: Jolt(s): No Heterogeneity: High Institutionalization: Low Status: High
7	Microfoundations of institutional change: Contrasting institutional sabotage to entrepreneurship	Lakshman and Akhter, 2015	Changes in the business context of sports (cricket)	National context of India vs. Australia	Jolt(s): No Heterogeneity: High Institutionalization: Low Status: n/a Social position: n/a India case: Jolt(s): No Heterogeneity: High Institutionalization: High Status: n/a Social position: n/a Early entrants case: Jolt(s): Yes Heterogeneity: Low Institutionalization: Low Status: Low Social position: Peripheral Late entrants case: Jolt(s): Yes Heterogeneity: Low Institutionalization: High Status: n/a Social position: n/a US case: Jolt(s): No Heterogeneity: High Institutionalization: Low Status: High
8	Overcoming the liability of newness: Entrepreneurial action and the emergence of China's private solar photovoltaic firms	Zhang & White, 2016	China's private solar photovoltaic firms	Early vs. late entrants	Jolt(s): Yes Heterogeneity: Low Institutionalization: Low Status: Low Social position: Peripheral Late entrants case: Jolt(s): Yes Heterogeneity: Low Institutionalization: High Status: n/a Social position: n/a US case: Jolt(s): No Heterogeneity: High Institutionalization: Low Status: High
9	Institutional Knots: A Comparative Analysis of Cord Blood Policy in Canada and the United States	Denburg, 2016	Cord blood policies	The policy context of the U.S. vs. Canada	Jolt(s): No Heterogeneity: High Institutionalization: Low Status: High

(continued on next page)

Table 4 (continued)

#	Title	Author and year	Case	What is compared?	Theory codes
					Social position: Central Canada case: Jolt(s): No Heterogeneity: n/a Institutionalization: High Status: High Social position: Central
10	Institutional entrepreneurship in transforming energy systems towards sustainability: Wind energy in Finland and India	Jolly et al., 2016	Wind energy	National context of Finland vs. India	Finland case: Jolt(s): Yes Heterogeneity: High Institutionalization: High Status: n/a Social position: n/a India case: Jolt(s): Yes Heterogeneity: High Institutionalization: Low Status: n/a Social position: n/a
11	Role of institutional entrepreneurship in the creation of regional solar PV energy markets: Contrasting developments in Gujarat and West Bengal	Jolly, 2017	Solar PV energy markets	Regional context of two states in India, Gujarat vs. West Bengal	Gujarat case: Jolt(s): Yes Heterogeneity: n/a Institutionalization: High Status: n/a Social position: n/a West Bengal case: Jolt(s): Yes Heterogeneity: n/a Institutionalization: High Status: n/a Social position: n/a

Table 4 shows that comparative case studies can be designed along various contextual dimensions, including technological, sectoral and geographical dimensions. What is more, comparisons can be motivated by theoretical concepts, such as comparing different field-level conditions or actor characteristics. While most studies have a strong empirical focus, such comparative case studies can provide a basis for further theorizing about institutional entrepreneurship. For example, one can extend the theory of institutional entrepreneurship by developing sub-theories on how institutional entrepreneurship unfolds differently across different technological, sectoral or geographical contexts and why it may occur more or less often across such contexts.

As a second emerging theme, we observed an increasing number of cases dealing with ‘collective institutional entrepreneurs’ (Garud et al., 2007), which we coded as such if agency originated from a collective of actors rather than a single actor. We even found that a slight majority of cases (55 %) dealt with collective forms of institutional entrepreneurship and that this percentage was increasing over time (see Figure 6).

Among the studies on collective institutional entrepreneurship, an important distinction can be made. On the one hand there are collectives that share a common interest and consciously work together to achieve a common goal, which for a long time has been part of institutional entrepreneurship research (Garud et al., 2007; Battilana et al., 2009). On the other hand, we found more dispersed forms of collective agency as a newly emerging phenomenon. Dispersed agency refers to groups of actors that do not share the same goals but nevertheless, sometimes even unknowingly, contribute to the same process of institutional change. This notion resonates the work of Garud and Karnøe (2005) who described the concept of ‘distributed agency’ where agency is distributed among actors, artifacts, rules and routines. In our cases, agency was not explicitly attributed to non-human actors, but it was nevertheless distributed among different kinds of actors not necessarily working together and sometimes even against each other. This distinction between unified and dispersed collective agency suggests that in case of the latter, one should think of institutional entrepreneurship rather than institutional entrepreneurs: we can only fully understand the institutional change process when taking a complex array of structural influences and groups of actors that contest and compete into account (Aldrich, 2011; Hargrave and Ven de Ven, 2006).

We found seven cases where a dispersed form of collective agency was explicitly mentioned. Two articles described a distributed nature of agency (Hermans et al., 2013; Whittle et al., 2011), another two articles explicitly mention dispersed agency (Jolly et al., 2016; Szkudlarek and Romani, 2016) and one other goes into controversies and tensions between various groups within the same institutional entrepreneurship process (Jolly and Raven, 2015). There was also a study highlighting the role of incumbents next to institutional entrepreneurs in institutional change (Gurses and Ozcan, 2015), while one other article interestingly claimed that

“institutional entrepreneurs may drive change initially, but, eventually, established players respond to, adapt, and exploit innovations” (Khavul et al., 2013: 46). Apart from these seven cases, some other cases dealt with dispersed collective agency as well, without the authors specifying it as such (e.g. Lakshman and Akhter, 2015; Ritvala and Salmi, 2010).

The role of collective versus individual agency may also change over time, highlighting the temporal aspect of institutional change processes (Dorado, 2005; Fligstein, 2001; Sutton and Dobbin, 1996; Weik, 2011). As an example, Wright and Zammuto (2013) write about institutional entrepreneurship in the field of sports, and describe how a ‘lone hero’ initially acquired the necessary resources, while a collective of actors subsequently managed to get it implemented. This temporal logic mirrors the strategies posed by Battilana et al. (2009), i.e. visioning and mobilizing and motivating followers. Thus, studies focusing on earlier stages of institutional change processes may frame institutional entrepreneurship as stemming from individual action, while studies focusing on later stages may frame the process as one driven by collective action. Once the temporal aspect is taken into account, however, many processes entail both individual and collective action (either or not through mobilization of allies) further along in the process in order to reach institutionalization. Reasoned from the initial instigator, institutional entrepreneurs “*evolve from self-serving actors with no field-level intentions to powerful groups that create a ripple effect in their environment by moving their target of influence from private to institutional actors*” (Gurses and Ozcan, 2015: 1709).

Interestingly, one article dealing with the inclusion of aviation in the EU emissions trading scheme by Buhr (2012) described how, in a reflexive manner, collectives of institutional entrepreneurs leveraged temporality by exerting specific activities only at favorable times in the institutional change process. And, in their analysis of the institutionalization of regenerative medicine in Tampere (Finland), Sotarauta and Mustikkamäki (2015) argue that different actors were of key importance in different stages of the process. Similarly, for the case of wind energy in India, it was observed that the “*locus of agency shifted from visionary scientists, entrepreneurs, experts, government officers (...) to the role of regulatory agencies and industry associations (...) followed by a range of actors, such as civil society groups and advocacy organizations*” (Jolly and Raven, 2015: 1009).

Recently, Brodnik and Brown (2018) criticized authors for being vague in justifying why they focus on particular time periods and periodization. They proposed a methodological approach to determine periods of institutional change agency as to be able to better focus qualitative research on such periods. However, we would still suggest investigations covering the entire institutional change processes to understand institutional entrepreneurship. Researchers need to identify all potential stages and map how the agency of multiple actors is distributed among multiple levels of action and multiple stages of development (Mahzouni, 2019).

7. How transition studies can benefit

The review provides us with various insights for transition studies. We first go into the similarities and complementarities between the two literatures (section 7.1). We then discuss the lessons for transitions studies regarding field-level conditions (section 7.2), actor characteristics (section 7.3), and processes and strategies of institutional change (section 7.4).

7.1. Similarities and complementarities

The processes of institutional change that institutional entrepreneurship scholars address, have considerable overlap with processes of ‘system building’ and ‘sustainability transitions’ covered by innovation system and transition studies. In particular, the framework of Technological Innovation Systems (TIS) describes key activities that are needed for actors to build a supportive innovation system for new technologies to develop and diffuse (Hekkert et al., 2007; Bergek et al., 2008). Among these key activities are visioning about the technology’s future and networking among stakeholders, very much in line with the strategies of visioning and mobilizing allies in the institutional entrepreneurship theory and the collective nature of most processes of institutional entrepreneurship. While TIS analyses delineate the system at hand by the actors that develop an emerging technology, they also pay attention to political and institutional contexts (Jacobsson and Bergek, 2004; Fuenfschilling and Truffer, 2014). As part of system building activities, structural couplings are created with political actors in the form of “*aligned institutions which enable the provision of specific resources that are essential for the further maturation of the TIS*” (Bergek et al., 2015: 59). And, similar to the institutional entrepreneurship literature, case studies of TIS also emphasize the temporality of system-building activities with the identification and modelling of ‘motors’ of complementary activities that set in motion processes of cumulative causation (Suurs and Hekkert, 2009; Kivimaa and Kern, 2016; Walrave and Raven, 2016).

The multi-level perspective (MLP) on sustainability transitions (Geels, 2002) is also largely consistent with the theory of institutional entrepreneurship. Here, the focus is not only on the emergence and institutionalization of innovative technologies and practices, but also on how innovations can fit, transform or replace an already existing technological regime as defined as “*...the rule-set or grammar embedded in a complex of engineering practices, production process technologies, product characteristics, skills and procedures, ways of handling relevant artefacts and persons, ways of defining problems; all of them embedded in institutions and infrastructure*” (Rip and Kemp, 1998: 338). Regimes make it hard for new technologies and practices to become accepted and established, as actors tend to stick to their existing routines and supporting infrastructures due to vested interests, sunk costs, and shared ideologies. The notion of a technological regime clearly is reminiscent of an organizational field with a high degree of institutionalization, which institutional theorists also consider as an unfavorable context for institutional entrepreneurship to occur (Battilana et al., 2009). For technological transitions to occur nevertheless, MLP scholars look at niches where new technologies and practices are tried out. As part of the process of niche creation, visioning and networking are also highlighted, just like in the TIS framework (Smith and Raven, 2012). Next to the niche and regime level, the MLP distinguishes landscape developments that are largely exogenous to regime and niche development, but may provide triggers and support for niche actors to challenge the regime. Such windows of opportunity that

occasionally open up are in line with the role of jolts and crises emphasized in the theory of institutional entrepreneurship (Battilana et al., 2009).

Institutional entrepreneurship theory is clearly relevant to transition studies, and in particular, the literatures on innovation systems and sustainability transitions. This is evident from our review on empirical cases of institutional entrepreneurship with a non-negligible percentage (27 %) carried out in the context of technological change, which is often a main focus within transition studies. In processes of radical innovation, institutional change is almost bound to occur, because innovations – be it new technologies, new services or new practices – generally do not fit the (sectoral) institutions inherited from the past. For innovations to become accepted and diffused, mental categories, social norms and government regulations need to be adapted to accommodate the adoption of an innovation, while, in turn, further innovative activities are needed to make the original innovation fit into the new institutions. It is the topic of co-evolution of technology and institutions that has been recurrently highlighted (Murmman, 2003; Nelson, 1995; Van den Belt and Rip, 1987; Zelizer, 1978), but is still to be taken up in the core of transition studies (Martin, 2012).

While some have explicitly linked the concept of institutional entrepreneurship to system building and sustainability transitions (Fuenfschilling and Truffer, 2014; Jolly and Raven, 2016; Jolly, 2017; Kukk et al., 2016), the theory of institutional entrepreneurship has had relatively little impact on the field of innovation and transition studies.² This is probably due, at least in part, to the different intellectual origins. The theory of institutional entrepreneurship is firmly rooted in the field of neo-institutional sociology. With its concept of embedded agency and the outline of enabling conditions at the field and actor level, the theory has been an attempt to solve the structure-agency paradox in sociological theorizing (Battilana et al., 2009). The notions of innovation systems and technological transitions are rooted in Schumpeterian economics (Dosi, 1988) supplemented with history of technology (Geels, 2002). The frameworks of TIS and MLP analyze institutional change only in a secondary way, as their focus lies primarily on technological transitions with institutional change being only one aspect of such processes. A further difference holds that, different from the institutional entrepreneurship theory as outlined by Battilana et al. (2009), TIS and MLP scholars have not aimed to build a theory that would explain under what conditions innovation systems emerge and transitions unfold. Rather, they use their frameworks to organize empirical material from in-depth case studies, often covering several decades, as to understand the complex processes of long-term change in particular sectoral contexts.

Having said this, our review has made clear that the way scholars have adopted and validated institutional entrepreneurship theory has not been very systematic. Relatively few studies provide a systematic validation of all hypothesized enabling field-level conditions and actor characteristics. What is more, the scant number of comparative studies on institutional entrepreneurship further shows that the empirical program has failed to exploit the variance among different geographical, technological and sectoral contexts to test the institutional entrepreneurship theory. And, with only a few cases looking at failed institutional entrepreneurship and covering the full range of variables proposed by Battilana et al. (2009), it has proven hard to learn from our review if there are typical conditions that explain failure. Instead, as our review showed, most empirical studies on institutional entrepreneurship do not focus so much on enabling conditions, but on the actor strategies of visioning and mobilizing allies in successful processes. That is, most scholars aim to understand *how* institutional entrepreneurship takes place rather than *why* it takes place in certain contexts rather than in others. In this sense, the empirical institutional entrepreneurship literature is similar to the literatures of TIS and MLP, where case studies also focus on how innovation systems are built and transitions unfold, and much less on why such processes take place under certain conditions rather than others. The recent ‘geographical turn’ in transition studies is changing this trend to some extent (Boschma et al., 2017; Truffer and Coenen, 2012), with scholars comparing niche-enabling conditions and regime constellations in different places to understand why niches occur in some places rather than others.

Given the many overlaps between the institutional entrepreneurship literature on the one hand and the literatures on TIS and MLP on the other, our next step is to distil a number of insights that transition scholars can gain from the many studies done on institutional entrepreneurship in the last decade.

7.2. Lessons related to field-level conditions

First, the finding from our review that is most consistent is the role of institutional **heterogeneity**. In 58 % of studies, we were able to characterize the institutions in the field as heterogeneous, while in only 22 % we were able to characterize the institutions in the field as homogeneous (and in the remainder of the studies, no clear characterization could be given). This suggests that in many fields, there is not so much a single institutional regime, but rather multiple orders or even a patchwork of institutions. Such heterogeneity provides opportunities for institutional change through institutional entrepreneurs who can legitimize their proposals by pointing to irregularities, inconsistencies or even contradictions between prevailing institutions. At the same time, they can build new institutions by selectively recombining different already existing institutions, a process also called ‘scaffolding’ (Mair et al., 2016). In such processes, new technologies can diffuse more effectively if the accompanying social norms and user practices are framed as an extension of deeper institutions prevailing in society.

In transition studies this signals the need for careful analysis of prevailing institutions, including institutions at the macro-level, as to avoid a too simplistic description of a prevailing regime as nomothetic and coherent. Traditionally, regimes have been

² To illustrate the limited impact of the theory of institutional entrepreneurship as outlined by Battilana et al. (2009) on innovation and transition studies so far, we looked into the Web of Science on November 6th, 2019. Out of the total of 597 citations to the article by Battilana et al. (2009) in Web of Science, only nine appeared in *Research Policy*, seven in *Technological Forecasting and Social Change*, six in *Environmental Innovation and Societal Transitions*, and two in *Industry and Innovation*.

characterized by shared rules, norms and expectations, leading to stability and incremental innovation rather than to instability and radical innovation (Geels, 2004, 2010). This characterization is useful, but tends to overlook potential heterogeneity within a stable regime that may be conducive of change. Instead, some proposed to view socio-technical regimes as ‘semi-coherent’ (Fuenfschilling and Truffer, 2014), allowing one to analyze regimes along a spectrum of varying degrees of institutionalization. One way to approach heterogeneity, then, is to identify within a regime the configuration of multiple institutional logics at the macro-level (such as state, market, community, profession, etc.) (Fuenfschilling and Truffer, 2014; Smink et al., 2015). Niches can develop when such logics are shifting over time (Clemens and Cook, 1999). A second avenue for research is to acknowledge that in many geographical contexts, multiple regimes co-exist with institutional interfaces and user practices being more or less aligned across regimes. In this context, scholars speak of a regime being ‘splintered’ into different sub-regimes (Van Welie et al., 2018). In all, our review of institutional entrepreneurship studies thus confirms these scholars in their plea to view regimes as semi-coherent at best and to link institutional heterogeneity within a regime to opportunities for institutional entrepreneurial (niche) activities.

The role of institutional heterogeneity at the field-level can also be approached from an agency perspective. Following Battilana et al. (2009), institutional entrepreneurs leverage heterogeneity by exploiting tensions and contradictions, which provide a certain degree of legitimacy for exploring alternatives. What is more, institutional entrepreneurs can also actively frame the field they operate in as being heterogeneous and fragmented so as to create, strategically, opportunities and support for institutional change processes (Fligstein and McAdam, 2011). Similarly, institutional entrepreneurs may actively position themselves as being part of multiple organizational fields, allowing them to strategically frame certain activities as being part of one field and other activities as being part of another field.

7.3. Lessons related to actor characteristics

This relates to our second important finding: institutional entrepreneurship studies often highlight the role of **social position** of institutional entrepreneurs. This aspect is hardly taken into account in a theoretical manner by scholars in the innovation systems or sustainability transitions literatures. Transition studies explicitly identify different types of actors, such as challengers, incumbents and intermediaries, but they tend to *assume* that different actors inherently have different social positions, instead of investigating this explicitly. Actor types may not always have the same social position. For example, incumbents who generally have a central social position and high status, may have those characteristics in one organizational field, but may act in the periphery of another field, initiating institutional change there (Pelzer et al., 2019). This shows that socio-technical regimes may overlap when actors central to one field become active in another, where they are likely less sanctioned deviating from an institutional status quo, which could also contribute to our understanding of regimes in the MLP.

It should further be noted that the theory of institutional entrepreneurship acknowledges that both high-status and low-status actors may drive institutional change. On the one hand, low-status actors with a peripheral position in an organizational field have less to gain by holding on to established institutions and would be less sanctioned when deviating from them. This is very much in line with niche players in MLP that challenge established actors and institutions with their innovative technologies and practices. On the other hand, high-status actors occupying a central position in an organizational field have better networks and access to resources to change institutions in the first place. This speaks more to innovation system research, highlighting the role of established players such as universities, ministries and multinationals in system-building activities. The ambiguity regarding the role of social position can be solved by reversing the two hypotheses and rephrasing them into a single one: that middle-status actors are least likely to bring about institutional change. This hypothesis fits in a broader sociological stream of literature on middle-status conformity (Phillips and Zuckerman, 2001; Prato et al., 2019), which has also been elaborated in economic geography. The main thesis, then, holds that divergent institutional change typically starts from peripheral actors (e.g., social movements, citizens, artists, start-ups), but needs to be ‘valuated’ by more central actors for them to diffuse (e.g., celebrities, government bodies, university professors, industry incumbents) (Grabher, 2018; Phillips, 2011). Both peripheral actors and central actors have an incentive to connect: peripheral actors need central actors to promote their ideas within the field as to get them accepted, while core actors need peripheral actors to reaffirm their status and to avoid disruption in the longer run (Cattani and Ferriani (2008)). As these two actor groups may often be disconnected, brokering individuals or intermediary organizations, connecting low-status groups and high-status groups, may also be crucial for change to occur (Cohendet et al., 2010).

Finally, transition scholars may take notice of processes of institutional change *within* organizations and accompanying institutional entrepreneurship on a **micro-level**. We observed multiple studies in our dataset showcasing such processes (Heinze and Weber, 2015; Spitzmueller, 2018; Tumbas et al., 2018; Whittle et al., 2011). For example, Heinze and Weber (2015) describe institutional change processes within two large established healthcare centers, while Tumbas et al. (2018) provides a bigger study on institutional entrepreneurship within 35 companies (both in manufacturing and service sectors). The focus on micro-level change processes is rather uncommon in transition studies (Upham et al., 2019). Scholars adopting an MPL or TIS framework generally limit their analysis to changing institutions at the meso-level of socio-technical systems or particular technologies. More recently, however, transition scholars called for more attention to the (possibly positive) role of incumbents in sustainability transitions (Duygan et al., 2019; Turnheim and Sovacool, 2019), but without taking into account the processes internal to these organizations. The aforementioned studies on institutional entrepreneurship within organizations may thus complement transition studies. Having said this, the focus on the meso-level is understandable given that organization and management studies cover these kinds of questions already at the micro-level with their own theoretical frameworks.

A key question in transition processes holds how institutional change taking place at the field level affects organizational routines and practices within organizations and *vice versa*. Without a translation of field-level change into micro-level change and back,

institutional change will remain limited in scope and effect. Transition scholars generally consider established organizations (incumbents) and networks as conservative and opposing institutional change (Lee and Hess, 2019; Smink et al., 2015), and new actors and networks at the niche level (challengers) as agents instigating change (Kemp et al., 1998). Institutional entrepreneurship studies at the micro-level instead point to the positive role of established organizations supporting institutional change and complying to new institutions once established. Their exact role, however, remains a contingent one which can be studied as such. For example, organization scholars theorized extensively about the conditions that lead established organizations to follow certain coping strategies regarding new institutions, including complying, compromising, defying, and manipulating (Oliver, 1991). Similarly, literature on the innovation acceptance underwrites the importance of individual actors and their willingness to change in the institutionalization of novel practices and technologies (Davis, 1989; Rogers, 1995). Such studies and literature streams may thus complement the works of transition scholars.

7.4. Lessons related to strategies

The review indicates that almost all studies (98 %) describe processes of visioning and most (86 %) describe mobilizing allies. The exact mechanisms that would explain why some strategies work and others might not, remain theoretically underexplored in most studies. This makes it hard to discern clear lessons for transition scholars that would add to the apparent similarities to processes of visioning and networking described in niche-building (Smith and Raven, 2012). To be able to identify lessons for transition scholars, it would be useful to perform a review study similar to this one focusing on the institutional work literature (Lawrence and Suddaby, 2006; Pacheco et al., 2010). These scholars have delved deeper into the kinds of strategies that institutional change agents – those wanting to create, disrupt or maintain institutions – can employ which may provide further insights useful for transition scholars. The additional focus on agents that actively aim to maintain institutions, as opposed to solely looking at those seeking to change them, provides further insights on resistance to change highlighted in transition studies.

The emerging theme of collective institutional entrepreneurship does carry some implications for transition studies. Our review showed that most processes of institutional entrepreneurship stem from collective institutional entrepreneurship rather than from single actors, showing a trend away from the traditional heroic institutional entrepreneur. For innovation systems and sustainability transitions scholars, this finding may not come as a surprise, as many studies showed that innovation systems and sustainability niches are built by collectives of actors, with different roles and varying interests (Hekkert and Negro, 2009; Smith and Raven, 2012). Where the sociological literature on institutional entrepreneurship may help however, is further theorizing about the varying stages and conditions under which such complex forms of collaboration in the context of innovation can emerge and be sustained. In such a theoretical endeavor, one has to move beyond classic models of collective action where costs and returns are exogenously defined. Instead, in processes of institutional change, actors and resources are mobilized within a process with a highly uncertain outcome, which also explains why mobilizing of allies needs to be preceded by the creation of a shared vision in an earlier stage. A shared vision may lead to shared expectations guiding investments in R&D as well as regulatory change (Borup et al., 2006). As institutional scholars have highlighted, the role of social movements often underlie institutional change processes as they can mobilize heterogeneous actors and resources under a common ideology and agenda. In the context of innovation and transitions such movements can be as heterogeneous due to the involvement of early adopters, user innovators, political activists, tech hobbyists, or even non-users (Hyysalo et al., 2016; Meelen et al., 2019; Boon et al., 2019). Here, institutional and transition scholars can mutually benefit from better theoretical understanding of collective action in the context of technological innovation and institutional change, also by aligning with the more recent wave of empirical studies on institutional work.

Furthermore, our findings showed that collective agency may not in all cases be unified and coherent. Instead, but distributed among actors pursuing different goals and not consciously collaborating towards the same goal. Understanding the dynamics of such processes of dispersed collective agency, especially adding a temporal context, is another challenge for transition scholars, where these insights of institutional theorists' can help.

8. Concluding remarks

Innovation and transitions often coincide with institutional change (Kaplan and Tripsas, 2008; Nelson, 1995; Zelizer, 1978), yet institutions and institutional theory have not yet been comprehensively theorized or implemented by transition scholars (Geels, 2004). In this paper we have extensively reviewed the literature on institutional entrepreneurship, a theory which transition scholars have started to adopt (e.g. Kukkk et al., 2016; Sotarauta and Pulkkinen, 2011). By reviewing the institutional entrepreneurship literature, we have identified lessons for transition scholars and related these to widely used frameworks around innovation systems (TIS) and sustainability transitions (MLP). This can help to better embed changing institutions and agency therein in transition studies.

To contextualize and identify strengths and weaknesses of the institutional entrepreneurship literature, we identified trends and biases using several descriptive codes. This showed that the literature is widely applicable among differing sectors and contexts. We furthermore found that there is a persistent bias towards success stories, leading to a lack of conceptual understanding of why institutional entrepreneurship fails, and a bias towards non-technological innovations accompanying institutional change. 27 % of our cases however revolved around technological innovations, showing a link to transition studies that has also heavily focused on novel technologies.

Using theory codes building on Battilana et al. (2009), we mapped the importance or influence of enabling conditions, but found that concepts related to these conditions were not consistently applied by scholars, leading to a lack of systematic accumulative

evidence. What stood out was that we identified that most cases that we were able to code on these conditions described heterogeneous and highly institutionalized, or mature, organizational fields. Actor characteristics were less often specified in empirical research, but still discussed in nearly half of our cases. Institutional entrepreneurial strategies, of formulating a vision and mobilizing allies, were described in close to all of our cases, showing that like scholars active in system-building and transition theories, institutional researchers focus more on the “how” than the “why” behind processes of institutional change. We also identified two emerging themes in the institutional entrepreneurship literature: the emergence of and further need for comparative research and the acknowledgement of collective institutional entrepreneurship, specifically in a temporal context.

Based on our review of institutional entrepreneurship, we distilled four important insights that transition scholars can benefit from. First, building on our finding that institutional heterogeneity often plays a conducive role for institutional entrepreneurship, transition scholars should be careful in conceptualizing and analyzing prevailing institutions, avoiding simplistic approaches assuming nomothetic homogeneity and coherence, which is a risk when using the regime concept of the MLP theory. Second, the social position of change agents should be taken into account. Acknowledging the ambiguous findings on the conduciveness of central, high status and peripheral, low status actors, it is more useful to build on the notion of middle-status conformity (Phillips and Zuckerman, 2001; Prato et al., 2019) and understand how actors on both ends of the spectrum can play vital roles in institutional change (Cattani and Ferriani (2008); Cohendet et al., 2010). Third, the importance of institutional change within organizations should not be overlooked in macro-level theories like TIS and MLP, as macro-level institutional change does not automatically trigger micro-level institutional changes needed for institutionalization (Upham et al., 2019). Fourth and last, in line with previous work by transition scholars, our review underlines the importance of understanding collective agency. Institutional entrepreneurship literature can help in theorizing how and under which (temporal) conditions complex forms of collaborative actions (e.g. unified or dispersed) can take place.

This research has several limitations. First, the data has been coded by one researcher, which lead to a risk of biased interpretations in the coding process. We have reduced this risk by having a co-author cross-code several samples to rule out irregularities. Relatedly, we chose to code in a binary fashion due to the size of our dataset and our interest to be able to identify patterns and visualize trends over time. However, in some cases attributing a binary code to certain theory codes proved to be a challenge, leading to a considerable amount of missing values and a potential risk of possible other interpretations and assigned codes in replicating our research. Lastly, institutional entrepreneurship research is closely related to other streams of research, such as institutional work (Lawrence and Suddaby, 2006; Pacheco et al., 2010; Pelzer et al., 2019) and social entrepreneurship literature (e.g. Dacin et al., 2010; Ebrashi and Darrag, 2017; McMullen, 2018; Tate and Bals, 2018), which fell outside the scope of the present study, though we tried to highlight important linkages with these literatures. Future review studies on the institutional work and social entrepreneurship literatures in the light of transition studies would be most helpful and complementary to the review we presented.

As briefly touched upon, our results showed that the notion of institutional entrepreneurship is widely applicable across different technological, sectoral and geographical contexts. This indicates that the theory could benefit from further theorization about contextual specificities, which would be an interesting avenue for future research. In order to do so, one could for example make theoretical cross-overs with theories around institutional logics (Thornton et al., 2012) and one may cross institutional entrepreneurship theories with comparative capitalism to question whether institutional change, and the related role of institutional entrepreneurs, may unfold differently in different national contexts (Thelen, 2018). It would also be interesting to delve further into the different types of institutional entrepreneurs we have observed and how their characteristics affect their ability to become successful institutional change agents. Due to the bias towards success cases in our dataset, we were not able to make any claims about the success of different types of institutional entrepreneurs. Future studies should be directed at identifying the strengths and weaknesses of different kinds of institutional change agents to expand our knowledge on this. Additionally, it would be interesting to understand the role of temporal context in processes of institutional change and develop an effective model to identify the potential stages of an institutional change process and allocate agency across these different stages to different (groups of) actors (Mahzouni, 2019). Both such efforts would aid in developing a systematic and thorough application of institutional change and entrepreneurship theory in the works of transition scholars.

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Appendix A. Coding protocol

Descriptive codes

Type of institutional entrepreneur

0 = One or more private firms

1 = One or more private firms collaborating with one or more other types of institutions

2 = One or more other type of institution, excluding private firms

Outcome

0 = Failure: it is described that the change envisioned and promoted by the institutional entrepreneur has not become institutionalized

1 = Success: it is described that the change envisioned and promoted by the institutional entrepreneur has become

institutionalized

Type of innovation

0 = Non-technological: an innovation not based on or using (a) novel technology or technologies

1 = Technological: an innovation based on or using (a) novel technology or technologies

Sector

0 = Manufacturing: the institutional change process takes place in a sector revolving around the process of making wares by hand or by machinery especially when carried on systematically with division of labor

1 = Services: the institutional change process takes place in a sector revolving around the process of the production of services instead of end products

Sector

0 = Public: part of the economy composed of public services and public enterprises

1 = Private: part of a country's economic system that is run by individuals and/or companies

Geography

0 = Low-income country: a country, often focused on agriculture and with relatively low GDP per capita, that is seeking to become more advanced economically and socially, including emerging economies, based on classification reports by the United Nations

1 = High-income country: industrialized countries with a relatively high GDP per capita, based on classification reports by the United Nations

Theory codes

Jolts/crisis

0 = There is no mention of an external event that has a shocking effect on the organizational field

1 = There is mention of an external event that has a shocking effect on the organizational field

Heterogeneity

0 = Low: the organizational field is described as consisting of a low number of institutional orders, or a low number of institutional orders that are compatible/complimentary, including institutional voids

1 = High: the organizational field is described as consisting of multiple, often conflicting or incompatible institutional orders, or there is mention of diverse norms/values/practices

Institutionalization

0 = Low: the organizational field is described to be experimental or novel entities in the field are described to be experimental, flexible and non-established, often the case in emerging organizational fields

1 = High: the organizational field is described to be standardized, established and generally resistant to change, often the case in mature organizational fields

Status

0 = Low: actors are described to have a low status, low experience and/or low legitimacy

1 = High: actors are described to have a high status, high experience and/or high legitimacy

Social position

0 = Peripheral: actors are described to have few connections within the (center of the) organizational field

1 = Central: actors are described to be well-connected to many central organizational field actors

Strategy: vision

0 = Strategies like framing, theorizing and story-telling or the development of a novel vision and articulation thereof are not described

1 = Strategies like framing, theorizing and story-telling or the development of a novel vision and articulation thereof are described

Strategy: allies

0 = Strategies around the mobilization of followers like stimulating collaboration, lobbying and negotiating are not described

1 = Strategies around the mobilization of followers like stimulating collaboration, lobbying and negotiating are described

References

- Aldrich, H.E., 2011. Heroes, villains, and fools: institutional entrepreneurship, NOT institutional entrepreneurs. *Entrep. Res. J.* 1 (2), 2.
- Armenakis, A.A., Bedeian, A.G., 1999. Organizational change: a review of theory and research in the 1990s. *J. Manage.* 25 (3), 293–315.
- Badi, S., Murtagh, N., 2019. Green supply chain management in construction: a systematic literature review and future research agenda. *J. Clean. Prod.* 223, 312–322.
- Battilana, J., 2006. Agency and institutions: the enabling role of individuals' social position. *Organization* 13 (5), 653–676.
- Battilana, J., D'ahunno, T., 2009. Institutional work and the paradox of embedded agency. In: Lawrence, T., Suddaby, R., Leca, B. (Eds.), *Institutional Work: Actors and Agency in Institutional Studies of Organizations*, Pp. 31–58. Cambridge University Press, Cambridge, UK.
- Battilana, J., Leca, B., Boxenbaum, E., 2009. How actors change institutions: towards a theory of institutional entrepreneurship. *Acad. Manag. Ann.* 3 (1), 65–107.
- Benford, R.D., Snow, D.A., 2000. Framing processes and social movements: an overview and assessment. *Annu. Rev. Sociol.* 26 (1), 611–639.
- Bergek, A., Jacobsson, S., Carlsson, B., Lindmark, S., Rickne, A., 2008. Analyzing the functional dynamics of technological innovation systems: a scheme of analysis. *Res. Policy* 37 (3), 407–429.
- Bergek, A., Hekkert, M., Jacobsson, S., Markard, J., Sandén, B., Truffer, B., 2015. Technological innovation systems in contexts: conceptualizing contextual structures and interaction dynamics. *Environ. Innov. Soc. Transit.* 16, 51–64.
- Blind, K., 2012. The influence of regulations on innovation: a quantitative assessment for OECD countries. *Res. Policy* 41 (2), 391–400.
- Block, J.H., Fisch, C.O., Van Praag, M., 2017. The Schumpeterian entrepreneur: a review of the empirical evidence on the antecedents, behaviour and consequences of innovative entrepreneurship. *Ind. Innov.* 24 (1), 61–95.

- Boon, W.P., Spruit, K., Frenken, K., 2019. Collective institutional work: the case of Airbnb in Amsterdam, London and New York. *Ind. Innov.* 26 (8), 898–919.
- Borup, M., Brown, N., Konrad, K., Van Lente, H., 2006. The sociology of expectations in science and technology. *Technol. Anal. Strateg. Manag.* 18 (3–4), 285–298.
- Boschma, R., Coenen, L., Frenken, K., Truffer, B., 2017. Towards a theory of regional diversification: combining insights from Evolutionary Economic Geography and Transition Studies. *Reg. Stud.* 51 (1), 31–45.
- Brodnik, C., Brown, R., 2018. Locating periods of institutional change agency: a mixed methods approach. *Int. J. Sociol. Soc. Policy* 38 (7–8), 510–525.
- Buhr, K., 2012. The inclusion of aviation in the EU emissions trading scheme: temporal conditions for institutional entrepreneurship. *Organ. Stud.* 33 (11), 1565–1587.
- Cattani, G., Ferriani, S., 2008. A core/periphery perspective on individual creative performance: social networks and cinematic achievements in the Hollywood film industry. *Organ. Sci.* 19 (6), 824–844.
- Chen, H.Z., 2013. A review of institutional theory and entrepreneurship. In: *The 19th International Conference on Industrial Engineering and Engineering Management* (Pp. 719–727). Heidelberg: Springer.
- Child, J., Lu, Y., Tsai, T., 2007. Institutional entrepreneurship in building an environmental protection system for the People's Republic of China. *Organ. Stud.* 28 (7), 1013–1034.
- Clemens, E.S., Cook, J.M., 1999. Politics and institutionalism: explaining durability and change. *Annu. Rev. Sociol.* 25 (1), 441–466.
- Cohendet, P., Grandadam, D., Simon, L., 2010. The anatomy of the creative city. *Ind. Innov.* 17 (1), 91–111.
- Dacin, P.A., Dacin, M.T., Matear, M., 2010. Social entrepreneurship: why we don't need a new theory and how we move forward from here. *Acad. Manag. Perspect.* 24 (3), 37–57.
- Davis, F.D., 1989. Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS quarterly*, pp. 319–340.
- Delmestri, G., 2006. Streams of inconsistent institutional influences: middle managers as carriers of multiple identities. *Hum. Relat.* 59 (11), 1515–1541.
- DiMaggio, P.J., 1988. Interest and agency in institutional theory. *Institutional patterns and organizations: Culture and environment* 1, 3–22.
- DiMaggio, P., Powell, W.W., 1983. The iron cage revisited: collective rationality and institutional isomorphism in organizational fields. *Am. Sociol. Rev.* 48 (2), 147–160.
- Dorado, S., 2005. Institutional entrepreneurship, partaking, and convening. *Organ. Stud.* 26 (3), 385–414.
- Dosi, G., 1988. Sources, procedures, and microeconomic effects of innovation. *J. Econ. Lit.* 1120–1171.
- Durand, R., McGuire, J., 2005. Legitimizing agencies in the face of selection: the case of AACSB. *Organ. Stud.* 26 (2), 165–196.
- 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.
- Ebrashi, R.E., Darrag, M., 2017. Social entrepreneurs' strategies for addressing institutional voids in developing markets. *European Journal of International Management* 11 (3), 325–346.
- Edquist, C., Johnson, B., 1997. Institutions and organizations in systems of innovation. In: *Edquist, C. (Ed.), Systems of Innovation: Technologies, Institutions and Organizations* (Pp. 41–63). Pinter, London, UK.
- Emirbayer, M., Mische, A., 1998. What is agency? *Am. J. Sociol.* 103 (4), 962–1023.
- Etzkowitz, H., 2001. The second academic revolution and the rise of entrepreneurial science. *Ieee Technol. Soc. Mag.* 20 (2), 18–29.
- Fligstein, N., 1997. Social skill and institutional theory. *Am. Behav. Sci.* 40 (4), 397–405.
- Fligstein, N., 2001. Social skill and the theory of fields. *Sociol. Theory* 19 (2), 105–125.
- Fligstein, N., McAdam, D., 2011. Toward a general theory of strategic action fields. *Sociol. Theory* 29 (1), 1–26.
- Fuenfschilling, L., Truffer, B., 2014. The structuration of socio-technical regimes—conceptual foundations from institutional theory. *Res. Policy* 43 (4), 772–791.
- 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.
- Garud, R., Karnøe, P., 2005. Distributed agency and interactive emergence. *Innovating strategy process* 88–96.
- Garud, R., Jain, S., Kumaraswamy, A., 2002. Institutional entrepreneurship in the sponsorship of common technological standards: the case of Sun Microsystems and Java. *Acad. Manag. J.* 45 (1), 196–214.
- Garud, R., Hardy, C., Maguire, S., 2007. Institutional entrepreneurship as embedded agency: an introduction to the special issue. *Organ. Stud.* 28 (7), 957–969.
- Geels, F.W., 2002. Technological transitions as evolutionary reconfiguration processes: a multi-level perspective and a case-study. *Res. Policy* 31 (8–9), 1257–1274.
- 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 (6), 897–920.
- Geels, F.W., 2010. Ontologies, socio-technical transitions (to sustainability), and the multi-level perspective. *Res. Policy* 39 (4), 495–510.
- Grabher, G., 2018. Marginality as strategy: leveraging peripherality for creativity. *Environment and Planning A: Economy and Space* 50 (8), 1785–1794.
- Greenwood, R., Suddaby, R., Hinings, C.R., 2002. Theorizing change: the role of professional associations in the transformation of institutionalized fields. *Acad. Manag. J.* 45 (1), 58–80.
- Gurses, K., Ozcan, P., 2015. Entrepreneurship in regulated markets: framing contests and collective action to introduce pay TV in the US. *Acad. Manag. J.* 58 (6), 1709–1739.
- Hall, B.H., Harhoff, D., 2012. Recent research on the economics of patents. *Annu. Rev. Econ.* 4 (1), 541–565.
- Hargadon, A.B., Douglas, Y., 2001. When innovations meet institutions: edison and the design of the electric light. *Adm. Sci. Q.* 46 (3), 476–501.
- Hargrave, T.J., Van de Ven, A.H., 2006. A collective action model of institutional change. *Acad. Manag. Rev.* 31 (4), 864–888.
- Heinze, K.L., Weber, K., 2015. Toward organizational pluralism: institutional intrapreneurship in integrative medicine. *Organ. Sci.* 27 (1), 157–172.
- Hekkert, M.P., Negro, S.O., 2009. Functions of innovation systems as a framework to understand sustainable technological change: empirical evidence for earlier claims. *Technol. Forecast. Soc. Change* 76 (4), 584–594.
- Hekkert, M.P., Suurs, R.A., Negro, S.O., Kuhlmann, S., Smits, R.E., 2007. Functions of innovation systems: a new approach for analysing technological change. *Technol. Forecast. Soc. Change* 74 (4), 413–432.
- Hermans, F., Stuiver, M., Beers, P.J., Kok, K., 2013. The distribution of roles and functions for upscaling and outscaling innovations in agricultural innovation systems. *Agric. Syst.* 115, 117–128.
- Holloway, C., 2015. Uber unsettled: how existing taxicab regulations fail to address transportation network companies and why local regulators should embrace uber, lyft, and comparable innovators. *Wake Forest J. Bus. Intell. Prop.* 16, 20.
- Holm, P., 1995. The dynamics of institutionalization: transformation processes in Norwegian fisheries. *Adm. Sci. Q.* 398–422.
- Hu, X., Hassink, R., 2017. Place leadership with Chinese characteristics? A case study of the Zaozhuang coal-mining region in transition. *Reg. Stud.* 51 (2), 224–234.
- Hughes, T.P., 1987. The evolution of large technological systems. *The social construction of technological systems: New directions in the sociology and history of technology* 51–82.
- Hyysalo, S., Jensen, T.E., Oudshoorn, N. (Eds.), 2016. *The New Production of Users: Changing Innovation Collectives and Involvement Strategies*. Routledge, London, UK.
- Isaksen, A., Kyllingstad, N., Rypestøl, J.O., Schulze-Krogh, A.C., 2018. Differentiated regional entrepreneurial discovery processes. A conceptual discussion and empirical illustration from three emergent clusters. *Eur. Plan. Stud.* 26 (11), 2200–2215.
- Jacobsson, S., Bergek, A., 2004. Transforming the energy sector: the evolution of technological systems in renewable energy technology. *Ind. Corp. Chang.* 13 (5), 815–849.
- Jolly, S., 2017. Role of institutional entrepreneurship in the creation of regional solar PV energy markets: contrasting developments in Gujarat and West Bengal. *Energy Sustain. Dev.* 38, 77–92.
- Jolly, S., Raven, R.P.J.M., 2015. Collective institutional entrepreneurship and contestations in wind energy in India. *Renewable Sustainable Energy Rev.* 42, 999–1011.
- Jolly, S., Raven, R.P.J.M., 2016. Field configuring events shaping sustainability transitions? The case of solar PV in India. *Technol. Forecast. Soc. Change* 103, 324–333.
- Jolly, S., Spodniak, P., Raven, R.P.J.M., 2016. Institutional entrepreneurship in transforming energy systems towards sustainability: wind energy in Finland and India.

- Energy Res. Soc. Sci. 17, 102–118.
- Kahl, S.J., Liegel, G.J., Yates, J., 2012. Audience structure and the failure of institutional entrepreneurship. In: Kahl, S.J., Silverman, B.S., Cusumano, M.A. (Eds.), *Advances in Strategic Management* (Vol. 29, Pp. 275–313). Emerald Group., Bingley, UK.
- Kanter, R.M., Stein, B.A., Jick, T.D., 1992. *The Challenge of Organizational Change: How Companies Experience It and Leaders Guide It*. Maxwell Macmillan International., New York, NY.
- Kaplan, S., Tripsas, M., 2008. Thinking about technology: applying a cognitive lens to technical change. *Res. Policy* 37 (5), 790–805.
- Kemp, R., Schot, J., Hoogma, R., 1998. Regime shifts to sustainability through processes of niche formation: the approach of strategic niche management. *Technol. Anal. Strateg. Manag.* 10 (2), 175–198.
- Khan, F.R., Munir, K.A., Willmott, H., 2007. A dark side of institutional entrepreneurship: soccer balls, child labour and postcolonial impoverishment. *Organ. Stud.* 28 (7), 1055–1077.
- Khavul, S., Chavez, H., Bruton, G.D., 2013. When institutional change outruns the change agent: the contested terrain of entrepreneurial microfinance for those in poverty. *J. Bus. Ventur.* 28 (1), 30–50.
- Kistruck, G.M., Beamish, P.W., 2010. The interplay of form, structure, and embeddedness in social intrapreneurship. *Entrep. Theory Pract.* 34 (4), 735–761.
- Kitchenham, B., 2004. Procedures for Performing Systematic Reviews 33. Keele University, Keele, UK, pp. 1–26.
- Kivimaa, P., Kern, F., 2016. Creative destruction or mere niche support? Innovation policy mixes for sustainability transitions. *Res. Policy* 45 (1), 205–217.
- Kukk, P., Moors, E.H., Hekkert, M.P., 2016. Institutional power play in innovation systems: the case of Herceptin®. *Res. Policy* 45 (8), 1558–1569.
- Lakshman, C., Akhter, M., 2015. Microfoundations of institutional change: contrasting institutional sabotage to entrepreneurship. *Canadian J. Admin. Sci.* 32 (3), 160–176.
- Lawrence, T.B., 1999. Institutional strategy. *J. Manage.* 25 (2), 161–187.
- Lawrence, T.B., Suddaby, R., 2006. Institutions and institutional work. *The Sage Handbook of Organization Studies* 2. pp. 215–254.
- Leca, B., Naccache, P., 2006. A critical realist approach to institutional entrepreneurship. *Organization* 13 (5), 627–651.
- Leca, B., Battilana, J., Boxenbaum, E., 2008. *Agency and Institutions: a Review of Institutional Entrepreneurship*. Harvard Business School, Cambridge, MA.
- Lee, D., Hess, D.J., 2019. Incumbent resistance and the solar transition: changing opportunity structures and framing strategies. *Environ. Innov. Soc. Transit.* 33, 183–195.
- Loorbach, D., van Bakel, J.C., Whiteman, G., Rotmans, J., 2010. Business strategies for transitions towards sustainable systems. *Bus. Strategy Environ.* 19 (2), 133–146.
- Maguire, S., Hardy, C., Lawrence, T.B., 2004. Institutional entrepreneurship in emerging fields: HIV/AIDS treatment advocacy in Canada. *Acad. Manag. J.* 47 (5), 657–679.
- Mahzouni, A., 2019. The role of institutional entrepreneurship in emerging energy communities: the town of St. Peter in Germany. *Renew. Sustain. Energy Rev.* 107, 297–308.
- Mair, J., Wolf, M., Seelos, C., 2016. Scaffolding: a process of transforming patterns of inequality in small-scale societies. *Acad. Manag. J.* 59 (6), 2021–2044.
- Major, M., Conceição, A., Clegg, S., 2018. When institutional entrepreneurship failed: the case of a responsibility centre in a Portuguese hospital. *Account. Audit. Account. J.* 31 (4), 1199–1229.
- Markard, J., Raven, R., Truffer, B., 2012. Sustainability transitions: an emerging field of research and its prospects. *Res. Policy* 41 (6), 955–967.
- Markowitz, L., 2007. Structural innovators and core-framing tasks: how socially responsible mutual fund companies build identity among investors. *Sociol. Perspect.* 50 (1), 131–153.
- Martin, B.R., 2012. The evolution of science policy and innovation studies. *Res. Policy* 41 (7), 1219–1239.
- Martin, B.R., 2016. Twenty challenges for innovation studies. *Sci. Public Policy* 43 (3), 432–450.
- McMullen, J.S., 2018. Organizational hybrids as biological hybrids: insights for research on the relationship between social enterprise and the entrepreneurial ecosystem. *J. Bus. Ventur.* 33 (5), 575–590.
- Meelen, T., Truffer, B., Schwanen, T., 2019. Virtual user communities contributing to upscaling innovations in transitions: the case of electric vehicles. *Environ. Innov. Soc. Transit.* 31, 96–109.
- Meyer, R.E., 2006. Review essay: visiting relatives: current developments in the new sociology of knowledge. *Organization* 13 (5), 725–738.
- Meyer, J.W., Rowan, B., 1977. Institutionalized organizations: formal structure as myth and ceremony. *Am. J. Sociol.* 83 (2), 340–363.
- Micelotta, E., Lounsbury, M., Greenwood, R., 2017. Pathways of institutional change: an integrative review and research agenda. *J. Manage.* 43 (6), 1885–1910.
- Morrison, N., 2017. Selling the family silver? Institutional entrepreneurship and asset disposal in the English housing association sector. *Urban Stud.* 54 (12), 2856–2873.
- Murmann, J.P., 2003. *Knowledge and Competitive Advantage: the Coevolution of Firms, Technology, and National Institutions*. Cambridge University Press, Cambridge, UK.
- Nelson, R.R., 1995. Co-evolution of industry structure, technology and supporting institutions, and the making of comparative advantage. *Int. J. Econ. Bus.* 2 (2), 171–184.
- Nelson, R.R., Winter, S., 1982. *An Evolutionary Theory of Economic Change*. Belknap Press of the Harvard University Press, Cambridge, MA.
- Oliver, C., 1991. Strategic responses to institutional processes. *Acad. Manag. Rev.* 16 (1), 145–179.
- Pacheco, D.F., York, J.G., Dean, T.J., Sarasvathy, S.D., 2010. The coevolution of institutional entrepreneurship: a tale of two theories. *J. Manage.* 36 (4), 974–1010.
- Pelzer, P., Frenken, K., Boon, W., 2019. Institutional entrepreneurship in the platform economy: how Uber tried (and failed) to change the Dutch taxi law. *Environ. Innov. Soc. Transit.* 33, 1–12.
- Phillips, D.J., 2011. Jazz and the disconnected: city structural disconnectedness and the emergence of a jazz canon, 1897–1933. *Am. J. Sociol.* 117 (2), 420–483.
- Phillips, N., Lawrence, T.B., Hardy, C., 2000. Inter-organizational collaboration and the dynamics of institutional fields. *J. Manag. Stud.* 37 (1), 23–43.
- Phillips, D.J., Zuckerman, E.W., 2001. Middle-status conformity: theoretical restatement and empirical demonstration in two markets. *Am. J. Sociol.* 107 (2), 379–429.
- Prato, M., Kypraios, E., Ertug, G., Lee, Y.G., 2019. Middle-status conformity revisited: the interplay between achieved and ascribed status. *Acad. Manag. J.* 62 (4), 1003–1027.
- Rao, H., Morrill, C., Zald, M.N., 2000. Power plays: how social movements and collective action create new organizational forms. *Res. Organ. Behav.* 22, 237–281.
- Righettini, M.S., Sbalchiero, S., 2017. Institutional entrepreneurship and change in consumer protection policy in the telecommunications sector: innovations in the text-based analysis approach. *Policy Soc.* 36 (4), 611–631.
- Rip, A., Kemp, R., 1998. Technological change. *Human choice and climate change* 2 (2), 327–399.
- Ritvala, T., Salmi, A., 2010. Value-based network mobilization: a case study of modern environmental networkers. *Ind. Mark. Manag.* 39 (6), 898–907.
- Rogers, E.M., 1995. *Diffusion of Innovations*. Free Press, New York, NY.
- Rotolo, D., Hicks, D., Martin, B.R., 2015. What is an emerging technology? *Res. Policy* 44 (10), 1827–1843.
- Salveti, E., O'Toole, P.W., 2017. When regulation challenges innovation: the case of the genus *Lactobacillus*. *Trends Food Sci. Technol.* 66, 187–194.
- Schaltegger, S., Wagner, M., 2011. Sustainable entrepreneurship and sustainability innovation: categories and interactions. *Bus. Strategy Environ.* 20 (4), 222–237.
- Schneiberg, M., Lounsbury, M., 2008. Social movements and institutional analysis. In: Greenwood, R., Oliver, C., Suddaby, R., Sahlin, K. (Eds.), *Handbook of Organizational Institutionalism* (Pp. 648–670). Sage, Thousand Oaks, CA.
- Schumpeter, J.A., 1934. *The Theory of Economic Development*. Harvard University Press, Cambridge, Mass.
- Seo, M.G., Creed, W.D., 2002. Institutional contradictions, praxis, and institutional change: a dialectical perspective. *Acad. Manag. Rev.* 27 (2), 222–247.
- Sewell Jr., W.H., 1992. A theory of structure: duality, agency, and transformation. *Am. J. Sociol.* 98 (1), 1–29.
- Smink, M.M., Hekkert, M.P., Negro, S.O., 2015. Keeping sustainable innovation on a leash? Exploring incumbents' institutional strategies. *Bus. Strategy Environ.* 24 (2), 86–101.
- Smith, A., Raven, R., 2012. What is protective space? Reconsidering niches in transitions to sustainability. *Res. Policy* 41 (6), 1025–1036.
- Sotarauta, M., Mustikkamäki, N., 2015. Institutional entrepreneurship, power, and knowledge in innovation systems: institutionalization of regenerative medicine in Tampere, Finland. *Environ. Plann. C Gov. Policy* 33 (2), 342–357.

- Sotarauta, M., Pulkkinen, R., 2011. Institutional entrepreneurship for knowledge regions: in search of a fresh set of questions for regional innovation studies. *Environ. Plann. C Gov. Policy* 29 (1), 96–112.
- Spitzmueller, M.C., 2018. Remaking “Community” mental health: contested institutional logics and organizational change. *Hum. Serv. Organ. Manag. Leadersh. Gov.* 42 (2), 123–145.
- Su, J., Zhai, Q., Karlsson, T., 2017. Beyond red tape and fools: institutional theory in entrepreneurship research, 1992–2014. *Entrep. Theory Pract.* 41 (4), 505–531.
- Suddaby, R., Greenwood, R., 2005. Rhetorical strategies of legitimacy. *Adm. Sci. Q.* 50 (1), 35–67.
- Sutton, J.R., Dobbin, F., 1996. The two faces of governance: responses to legal uncertainty in US firms, 1955 to 1985. *Am. Sociol. Rev.* 794–811.
- Suurs, R.A., Hekkert, M.P., 2009. Cumulative causation in the formation of a technological innovation system: the case of biofuels in the Netherlands. *Technol. Forecast. Soc. Change* 76 (8), 1003–1020.
- Szkudlarek, B., Romani, L., 2016. Professionalization through dispersed institutional entrepreneurship: the case of the intercultural community. *J. Organ. Chang. Manag.* 29 (1), 93–107.
- Tate, W.L., Bals, L., 2018. Achieving shared triple bottom line (TBL) value creation: toward a social resource-based view (SRBV) of the firm. *J. Bus. Ethics* 152 (3), 803–826.
- Thelen, K., 2018. Regulating Uber: the politics of the platform economy in Europe and the United States. *Perspect. Politics* 16 (4), 938–953.
- Thornton, P.H., Ocasio, W., Lounsbury, M., 2012. *The Institutional Logics Perspective: A New Approach to Culture, Structure, and Process*. Oxford University Press on Demand, Oxford, UK.
- Truffer, B., Coenen, L., 2012. Environmental innovation and sustainability transitions in regional studies. *Reg. Stud.* 46 (1), 1–21.
- Tumbas, S., Berente, N., Brocke, J.V., 2018. Digital innovation and institutional entrepreneurship: chief Digital Officer perspectives of their emerging role. *J. Inf. Technol.* 33 (3), 188–202.
- Turnheim, B., Sovacool, B.K., 2019. Forever stuck in old ways? Pluralising incumbencies in sustainability transitions. *Environ. Innov. Soc. Transit* in press.
- Upham, P., Bögel, P., Dütschke, E., 2019. Thinking about individual actor-level perspectives in sociotechnical transitions: a comment on the transitions research agenda. *Environ. Innov. Soc. Transit.* <https://doi.org/10.1016/j.eist.2019.10.005>.
- Van den Belt, H., Rip, A., 1987. The Nelson-Winter-Dosi model and synthetic dye chemistry. The social construction of technological systems. *New Direct. Sociol. History Technol.* 135–158.
- Van Welie, M.J., Cherunya, P.C., Truffer, B., Murphy, J.T., 2018. Analysing transition pathways in developing cities: the case of Nairobi’s splintered sanitation regime. *Technol. Forecast. Soc. Change* 137, 259–271.
- Walrave, B., Raven, R., 2016. Modelling the dynamics of technological innovation systems. *Res. Policy* 45 (9), 1833–1844.
- Weik, E., 2011. Institutional entrepreneurship and agency. *J. Theory Soc. Behav.* 41 (4), 466–481.
- Whittle, A., Suhomlinova, O., Mueller, F., 2011. Dialogue and distributed agency in institutional transmission. *J. Manag. Organ.* 17 (4), 548–569.
- Wright, A.L., Zammuto, R.F., 2013. Creating opportunities for institutional entrepreneurship: the colonel and the cup in english county cricket. *J. Bus. Ventur.* 28 (1), 51–68.
- Zelizer, V.A., 1978. Human values and the market: the case of life insurance and death in 19th-century America. *Am. J. Sociol.* 84 (3), 591–610.
- Zilber, T.B., 2007. Stories and the discursive dynamics of institutional entrepreneurship: the case of Israeli high-tech after the bubble. *Organ. Stud.* 28 (7), 1035–1054.
- Zucker, L.G., 1977. The role of institutionalization in cultural persistence. *Am. Sociol. Rev.* 726–743.