

THE ROLE OF OBJECTS FOR INSTITUTIONAL WORK IN ENERGY EFFICIENT RENOVATION

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Energy efficient renovation measures for public buildings implicates organizational change. Involved in the processes of change are both humans and objects. Studies on institutional work has hitherto mainly focused on human actors as agents for change, thus taken less consideration in objects' role. In this paper, a sociomateriality lens is applied with the aim to increase the understandings of objects' role for institutional work in energy efficient renovation. The paper is conceptual and data is derived from three empirical case studies encompassing research on organizational change and energy efficient renovation. The cases are used as illustrations on how different types of objects relate to different forms of institutional work. It is concluded that objects, together with the roles and attributes they are given, have effect on the changing organizational practices related to energy efficient renovation and that objects are part of institutional work.

Keywords: energy efficiency, renovation, objects, institutional work, Sociomateriality

INTRODUCTION

In this paper, the role of non-human actors (artefacts, material objects, hereafter labelled 'objects'), for motivating and shaping institutional work (IW) is discussed. The empirical context is the construction industry, a highly complex and institutionalized industry (Kadefors 1995), facing problems of disrupting existing institutions as well as creating new ones (Bresnen 2013). The paper is foremost conceptual and the discussion is based on data derived from three previous case studies encompassing research on processes of organizational change, with a specific focus on energy efficient renovation of public buildings. In Sweden, many public buildings, both premises (e.g. schools and hospitals) and housing (apartments and row houses), were built during the millennium program, a public housing programme implemented between the years 1965-1974. Many of these buildings are now in an urgent need of renovation as they have reached their technical lifespan. Responsible for this renovation are public construction clients. While renovating, public construction clients need to consider energy efficiency goals established globally as well as nationally. The building sector in Sweden is, compared to 1995 levels, aiming at a 20% reduction in energy use by 2020 (Thollander 2013) and the biggest technical potential to achieve this goal is in adopting energy efficient measures in existing buildings, especially those from the millennium program (Energimyndigheten 2013). The three case studies will be used as illustrations of how energy efficiency issues

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are enacted and unfolded in practice, with a special focus on the objects' role for change processes and IW.

Research has suggested that energy efficient building faces several challenges in disrupting old and creating new institutions (Andrews and Johnson 2016) in which institutions refers to rules, norms, beliefs and logics embedded in an organization and its context. In order to increase the understandings of how institutions are disrupted and/or created (or maintained) researchers need to pay closer attention to practices and to the IW performed by the actors involved (Gluch and Bosch-Sijtsema 2016). In processes of energy efficient renovation, this means trying to understand how IW is carried out and also by which actors. In response to the latter, recent research argues that not only humans, but also objects are actively part of energy efficient renovation processes (see for example Thoresson 2015; Palm and Reindl 2016; Buser and Carlsson 2016). In a study of a Swedish public housing company's energy efficient renovation process, Palm and Reindl (2016) found, by applying a practice theory framework, that existing technical infrastructure largely determined what issues came up for discussion at meetings. Thus, rather than discussing new technology and innovative solutions most meetings were spent discussing technology used in the past. Suggested measures were also based on an idea that energy efficiency is unproblematic, and could be handled in the same way regardless of context and situation. In another study, Thoresson (2015) found, by using an Actor Network Theory approach, that the way energy issues were enacted in practice was not solely determined by the (public) housing organization involved in the renovation project, but also included several intertwined actors and processes such as; urban planning, national housing policies and old technology. Old technology was, for example, not seen as "neutral" technology, rather it took an active part in the energy work (Thoresson 2015).

In this paper, a practice based view is adopted, seeing organizing as something that is becoming through everyday practices (Orlikowski 2007). A sociomateriality lens (Orlikowski 2007) is applied in order to increase the understandings of objects' role for institutional work (Lawrence and Suddaby 2006) in energy efficient renovation. Both theoretical approaches have been used to a low extent in construction management research (Bresnen 2017; Styhre 2017). In cross-fertilizing these two practice-oriented lenses, we acknowledge that objects cannot operate alone; neither can influence be attributed to agency of humans alone either. In line with work by Hampel *et al.*, (2017), Monteiro and Nicolini (2015) and Raviola and Norbäck (2013), this paper argues that artefacts/objects can be seen as complex assemblages of humans and material elements that perform IW when certain alignments are put in place.

We postulate that the material contains agency; and that both humans and objects have the capacity to act (cf. Styhre 2017). Combining a sociomateriality lens with the IW framework, raises a number of questions, such as: Do objects perform IW in processes of developing new practices? Both tangible and non-tangible objects have been found to occur in IW in other organizational settings (cf. Raviola and Norbäck 2013), is that also the case for energy efficient renovation? Could one object alone account for different forms of IW? More, it has been argued that different dimension of agency, according to actions' direction in time (past, present and future) might be associated with different forms of IW (Battilana and D'Aunno 2010). Could it also be that different forms of objects according to their position in time, i.e. past, present and future, are associated with different forms of IW?

Addressing the above questions, a sociomateriality lens is applied with the aim to increase the understanding of objects role for institutional work in construction, and specifically for energy efficient renovation of public buildings.

THEORETICAL FRAMEWORK

As scholars of institutionalism begin to draw on practice theories to inform their theorizing on institutional change, thus focusing on the micro-dynamics of institutional change as performed by people's actions (Feldman and Orlikowski 2011), this has given origin to an interest in institutional work of actors (Lawrence and Suddaby, 2006). Adopting a practice perspective in research recognizes that it is in micro level practices that field-level logics are enacted (Smets *et al.*, 2012), a view which is shared by scholars studying IW. Jarzabkowski *et al.*, (2009: 289) state: "a practice approach is apposite to the study of IW because it focuses on the actions and interactions of actors in creating, maintaining and disrupting institutions. It also puts the level of analysis onto the everyday work of actors and how this work is shaped by institutions, even as it reproduces or modifies those institutions". The concept of IW examines and describes how institutions are created, maintained, and disrupted through purposive actions of multiple actors (Lawrence and Suddaby 2006). In addition to a practice-based approach (Jarzabkowski *et al.*, 2009), IW stems from a research tradition that has agency as its focal point of interest (Hampel *et al.*, 2017). Agency within the IW is viewed as embedded, meaning that institutions both shape, give meaning and hold together material and symbolic structures (Battilana and D'Aunno 2010).

Scholars studying IW have hitherto foremost focused on human actors as agents for change (Hampel *et al.*, 2017), thus to a large extent neglected the role played by the material (Monteiro and Nicolini 2015). Up to today, the role of objects in IW has been explored only in a handful of studies (Hampel *et al.*, 2017). Raviola and Norbäck (2013), for example, studied how an old technology became the object of reference in problematizing a current situation, functioning as a "lawbook" for new actions. This process, in which actors consult and interpret the "law book" was understood by the authors as institutional work, in which meaning and technology was intertwined. In another study; awards (prizes) were viewed as complex assemblages of humans and material elements. These assemblages performed IW, such as mimicry, theorizing and educating, when certain alignments were put in place (Monteiro and Nicolini 2015). The study highlighted how IW depends on the joint work of human and material entities. More, in a study on housing, the roles of physical place (the interaction of locations, material forms, meanings and values) for IW was investigated (Lawrence and Dover 2015).

Firstly, physical place established and maintained boundaries around institutions, and, secondly, it provided an interpretive lens through which people could understand the institutions that actors are working to affect. Thirdly, physical place complicated IW through its "concreteness", meaning its materiality, its association with day-to-day routines, and its geographical location. Thus, a few previous studies have shown that not only humans, but also objects/materials (technology, awards and places) need to be accounted for when investigating IW and changing practices. It has been suggested that the study of the material offers promise for a deeper and wider understanding of IW (Hampel *et al.*, 2017). However, to move forward it is also suggested to combine IW with perspectives from social science, for example, sociomateriality.

Generally, in recent organizational research, the material has been attributed a more active role in understanding interaction, practice, and the process of organizing (Leonardi

2013). Here has sociomateriality been suggested as a viable theoretical lens to understand the material in social practices. Applying the sociomateriality lens means seeing practice as a sociomaterial accomplishment, organizing occurs in practice and practice is neither social nor material; it is both (Leonardi 2013). The material, being all things not human, such as a landscape, material of buildings, rain and software (Carlile *et al.*, 2013), and the social are so fundamentally related that it makes little or no sense to talk about one without talk about the other "... there is no social that is not also material, and no material that is not also social" (Orlikowski 2007: 1437), hence, there is no social action that does not entail material means (Jones 2014).

Sociomateriality is a research stream (Jones 2013) that follow the materiality turn in organizational studies. Being a stream of research, the umbrella term sociomateriality offers different possibilities of how to study the relationship between the "social" and the "material" and researchers have developed an array of perspective that theorize about the relationship between the symbolic and the material world (Jones 2013; Putnam 2015). In this paper, the research interest lies in the study of the "constitutive entanglement of the social and the material in everyday organizational life" (Orlikowski 2007: 1438). The material and the social are viewed as inseparable in practice, however, analytically separable (Jones 2013). Seen from this view, the key is not just to understand how different entities shape each other, but also what the consequences/implications for practice are. Through the sociomateriality lens, relations and boundaries between the social and the material are not given, they are enacted (Jones, 2014), the material is seen as relational; it takes part in establishing and maintaining social relationships (Carlile *et al.*, 2013). With the example of discursive practices, Orlikowski and Scott (2015) underline that in order to exist, discourse must be materialized in some form, thus the discursive do not affect the material, rather it becomes materialized. Discourse lacks an independent, self-contained existence apart from the material. Materiality and discourse are constituted through each other (Orlikowski *et al.*, 2015: 699).

As both the sociomateriality lens and the IW framework share a common ontological base, i.e. they are theoretical grounded in practice theory, it is suggested that these two concepts can be cross-fertilized. We propose that not only will the study of the material help expand our knowledge on IW, but the IW framework can also help shed light on actions and outcomes that are linked to materialized processes.

RESEARCH APPROACH AND METHOD

This paper is informed by three empirical cases concerning energy efficient renovation of public buildings which are used as illustrative stories of how objects play an active part in IW related to processes of change in construction. All three cases concern a shared challenge on how to renovate rundown public buildings in a holistic and long-term energy efficient way. For the three case organizations, this involved extensive work and increased collaboration with a variety of stakeholders in order to develop long-term strategies, imposing changed management processes and maintenance routines.

Case one concerns a Swedish public construction client organization that sought to meet energy efficiency targets by the means of a development project. Empirical data analysed for the purpose of this paper was continuously collected by the authors in 2016. Data included in the analysis of this paper is based on meeting observations. Case two builds on secondary data presented in a doctoral monograph thesis (Thoresson 2015). The thesis provides a detailed narrative regarding how energy issues were enacted in practice in a large renovation project of a block of flats owned by a public housing company. Data was collected through interviews, observations of meetings and from organizational

documents. To get a deeper insight into the role of objects in this project, one of the authors conducted a one-hour interview with Thoreson. In case three, the study object was a strategic project done in response to a political directive to significantly cut the energy use in hospital buildings managed and operated by a public construction client organisation. Several of these hospitals were built between the years 1950-1975, and the buildings were in need of rather immediate renovation. One of the authors was involved in the collection of data in 2011, following the strategy project in real time. For the purpose of this paper transcripts of nine working meetings in a strategic work group were analysed. Informed by a narrative approach, all three case studies have used ethnographically informed methods, enabling the understanding of how institutions are enacted at micro-levels.

In order to contribute to further development of the IW framework, focus was on the IW processes, rather than institutional outcomes (Lawrence *et al.*, 2013). The sociomateriality lens were used in combined with the theoretical construct of IW when analysing data from the three studied cases, according to the procedure of thematic theoretical coding (Braun and Clarke 2006). Following a call for research that focus on multiple types of materiality (Putnam 2015), a specific type of object was not targeted, rather all kinds of possible objects suggested to be involved in the processes of energy efficient renovation were searched for. This included both tangible and non-tangible objects, as well as objects that were present, objects that were no longer present (past objects) and future objects. Also, accounted for in the analysis was the interaction between the objects and the social world and the consequences from this “entanglement”, i.e. what situated outcomes and what type of IW was enacted?

CASE ANALYSIS

Case One - Energy Efficiency and Renovation of Pre-Schools

In case one, various artefacts emerged as influential agents, playing a central role in the process of the development of new practices. The following are two examples of objects that were part of the process of creating new practices i.e. support change; the run-down building stock and temporary rented pavilions. Both of these (tangible) objects dominated the discourse during meetings and were used by the participants as key arguments for the change. As one project-member describes the building stock during an interview: “the [current] large renovation-bulge is knocking on our door, and they are saying: you have to take care of all of us.” Another member referred to the problem with a run-down building stock in terms of “a massive explosive mountain... [and it is] we cannot shove this mountain in front of us any longer” and “[now] comes hell”. Similarly, the rented pavilions (existing and presumed-planned) became a shared object that helped unifying the project team in their change mission. “The alternative that we must avoid, is pavilions...” “We need to present an alternative to pavilions that the politicians can’t reject”. Further, the need for a new IT-based system, that should be “better” than previous ones, be able to handle “all the data”, and possible to be used by various stakeholders, in different organizations, was mentioned as a necessity for the new way of working to be implemented. This kind of IT-system is not yet on the market but the plan still was said to be dependent on it and a large amount of time during meetings was spent discussing it. Thus, in this case various objects served as reference for shaping new practices. Both tangible objects (such as the houses) and non-tangible ones (such as a wanted IT-system) could be identified. Further, the run-down building stock is an object that is present today, whereas the pavilions were discussed as something belonging to the past and/or something that must be avoided in the future and the IT-system is wanted for

the future. Thus, the materials objects can firstly, be divided into three categories depending on their place in time (past, present or future) and secondly, in two categories depending on they were tangible or non-tangible.

Case Two - Energy Efficient Renovation of a Block of Flats

From this case, and as examples of objects that were part of processes of IW, an (old-existing) system for district heating and solar-panels (not yet existing) are chosen as illustrative examples. In the end, solar-panels were ruled out to the advantage of keeping the current district heating system. Two organizations were working together with the issue of energy-efficient solutions for the renovated houses: the municipal energy corporation and the public housing company. These two organizations had different ideas on what energy solution to choose, the municipal energy corporation argued for keeping the existing district heating system in its current form, whereas the public housing company wanted to change the current solutions in several ways, for example by installing solar panels on the houses. The (future) solar panels were given many positive attributes by the municipal housing company; they were sought to provide several parts of the city with electricity, and as such would give the neighbourhood in which they were to be placed good publicity and they were argued to contribute to a decentralised, sustainable and small-scale infrastructure system for energy supply.

The municipal energy corporation on the other hand argued that in the future, the city would be in need of (much) more energy than today, and that solar panels are to unreliable. According to them, the existing district heating system should be kept. By them, the district heating system was labelled as a complex and complicated system, difficult for anyone outside their own organization to understand, and as such no other organizations than the municipal energy corporation themselves could be able to work with it or to truly understand it. They argued that since the public housing company did not have all information needed they could not come up with suggestions for altering the system. Further, the district heating system was given the role as facilitator, with the possibility to create economic growth and an increase in population in the city and thus from this view it was given a large impact on the whole city's future development. In addition to these arguments and the attributes given to the system by the municipal energy corporation, material aspects of the system itself could also be said to contribute to it being kept. The district heating system was imbedded in the infrastructure of the city, for example it was intertwined with sidewalks and streets.

Case three - energy efficient renovation of hospital buildings

In case three, various objects served as non-human agents in playing a central role for the development of an action plan for improved energy efficiency. An example of object that were part of this process was an object named 'the blue ball'. 'The blue ball' was a construct that firstly illustrated additional investment costs needed to cut total energy use to half of today's use, i.e. costs added to the funding already allocated for renovation. The colour blue came from an initial cost estimate graph in which this cost element coincidentally was blue. Over time, the non-tangible 'blue ball' object came to take an all-compassing discursive role in the development process. It was referred to as something 'discovered' in that it was an eye-opener for the strategic work group helping them to shift focus from costs to funding: "Discovering the 'blue ball' helped us to establish that this might very well be about money, but not as (only) costs." It became the focus of attention as it, often without deeper explanations, came to represent funding as a multi-dimensional problem that needed to be mastered; "The 'blue ball' is the hindrance that need to be managed." This could concern questioning others' engagement; "(The

question is) if they are committed... to find the 'blue ball'." To distinct the new way of thinking against the usual way: "The 'blue ball' is outside the box." Or just to emphasise the financial dimension of the problem: "Well it's (simply) the 'blue ball'." In this case 'the blue ball' object and construct served as reference for proposing new investment practices as well as introducing a for the organization new way of thinking. The object is both tangible, in that it is displayed in all types of power-point presentations used both within the strategic work group and outside in them proposing a new way of approaching renovation of the hospital buildings. However, being a loosely defined construct, used to serve a variety of self-centred purposes in various types of conversations, it is also non-tangible. Further, 'the blue ball' is illustrating a wanted future state but also represents the past in terms of what was included in the construct at the time it was 'discovered'.

DISCUSSION AND IMPLICATIONS

Analysing the empirical cases, we saw, similar to the work by Raviola and Norbäck (2013) that various non-human objects served as reference for shaping new, destroying old and maintaining current practices. This included both tangible, such as the pavilions, and non-tangible objects, such as the IT-system and objects with different positions in time. It was also shown that one object can be both tangible and non-tangible, for example with "the blue ball" in case three. Findings from the cases also suggest that there was a difference between how past, present and future objects were used when creating legitimacy for a new order, and thus what role they had in shaping IW. In case one, past objects were used as examples of how badly old practices had worked and were used to "attack" the taken-for-granted of an old institution (disrupting institutions). In this case the actors were actively trying to establish new practices, "selling" their ideas, whereas in the study by Raviola and Norbäck (2014), it appears as the actors were forced to respond and adapt to new technology and ways of working. Future objects were mainly used in order to create new practices and possibly new institutions, as for example the IT system in case one, the solar panels in case two and the blue ball in case three. Their existence was often depending on trust and collaboration between different stakeholders and they were part of creating institutions. In case two an existing (present) object, the district heating system, were found to be part of maintaining an institution.

We noted that emotions, especially fear, were present when both past and future objects were involved in IW processes. Both new and old objects were seen as "dangerous" and threatening to current ways of living and for the future development of cities. When new practices regarding energy efficient renovation were introduced, this created a feeling of "threat", i.e. these new practices threatened not just processes and work roles (cf. Gluch and Bosch-Sijtsema 2016) but also the existence of present material entities (objects), that brings with them meaning, values and work opportunities. Being not only threatening, future objects could also be seen as a sort of resolution of this fear. They were associated with hope, collaboration between stakeholders, "rational choices" and more thorough planning.

We could see that the same object was involved in different types of IW depending on the context in which it was embedded (cf. Monteiro and Nicolini 2015). The solar panels were used when the public housing company tried to establish new practices, i.e. created institutions by connecting the panels to the government ideals on small scale energy supply and by promoting increased interest for the neighbourhood in which they were to be placed. They were also used by another actor in relation to the district heating system as a bad and risky choice, thus they took part in maintaining an old institution. We could also see that one object alone (the district heating system) was associated with different

types of agency, directed towards the past, present and future, in the IW of maintaining institutionalized practices.

By arguing that new technology was too unreliable the old, legitimate institutional practice (the district heating system) was chosen at the advantaged over a new one (agency directed towards the past). Further, by “black-boxing” the current system, i.e. making it impossible for people outside a specific organization to understand it, and by the system’s embeddedness in the current infrastructure, its current features were associated with present agency. The district heating system was, as an example, promoted on the basis of its usefulness in the future, as in the future development of an entire city, i.e. future oriented projective agency. Thus, like human actors have been found to draw on all three institutional work processes (creation, maintenance, and disruption) to achieve a desired outcome (Jarzabkowski *et al.*, 2009) we found that that same can be true for one object alone in terms of agency. However, in this study we did not find that a single object was involved in all three institutional work processes simultaneously, i.e. both creating, maintaining and disrupting institutions. To get a more comprehensive view more empirical studies are needed.

Exploring the relationship between the social and the material has implications for both theory and management practice. For theory building the paper adds to previous work by the authors (Gluch and Svensson 2016), by furthering layers to a conceptual model envisioning agencies of various actors in processes of change. In this previous research, a process through which new practices were developed and tested was followed in real time. It was found, by applying a distributed view of agency, that candidates for institutions, so called proto-institutions, were created and old institutions disrupted, as key actors, both human and non-human, sought to establish legitimacy for the new way of working and objects served as agents for change in the process of creating and disrupting institutions.

The studies together provide a furthered layered understanding on institutional work related to changes in the building industry driven by a sustainability agenda (Gluch and Bosch-Sijtsema 2016, Bresnen 2013, 2017). For practice the paper raises issues regarding manager’s view on objects. Managers often “treat objects, for example technology, as having specific properties or clear-cut boundaries that determine organizational behaviours” (Putnam 2015). This tells us that technology often tend to become “responsible” for a certain outcome, rather than the material and the social together. Instead, it is suggested that “non-human (material) agencies are mutually responding counterparts of a distributed agency that produces collective actions, by mobilizing a large number of (human and non-human) entities taking part in this action” (Raviola and Norbäck 2013: 1175).

In conclusion, we argue that objects do pursue agency in processes of energy efficient renovation, that agency is thus distributed in a network of human and non-human entities that act (Raviola and Norbäck 2013) and that the IW performed by objects depends on the joint work of humans and material entities (Monteiro and Nicolini 2014). In this arrangement, various objects propose solutions that an individual in isolation would not have thought about or had access to which brings us to the ideas of sociomateriality, recognizing that the human and the non-human is entangled in practice. Thus, objects themselves, together with the roles and attributes they have been given have effect on organizational practices related to energy efficient renovation.

REFERENCES

- Andrews, R N L and Johnson, E (2016) Energy use, behavioural change, and business organizations: Reviewing recent findings and proposing a future research agenda. *Energy Research and Social Science*, **11**, 195-208.
- Battilana, J and D'Aunno, T (2010) Institutional work and the paradox of embedded agency. In: T B Lawrence, R Suddaby, and B Leca (Eds.) *Institutional work Actors and Agency in Institutional Studies of Organizations*. Cambridge, UK: Cambridge University Press.
- Braun, V and Clarke, V (2006) Using thematic analysis in psychology. *Qualitative Research in Psychology*, **3**(2), 77-10.
- Bresnen, M (2013) Advancing a 'new professionalism': Professionalization, practice and institutionalization. *Building Research and Information*, **41**(6), 735-41.
- Bresnen, M (2017) Being careful what we wish for? Challenges and opportunities afforded through engagement with business and management research. *Construction Management and Economics*, **35**(1-2), 24-34.
- Buser, M and Carlsson, V (2016) What you see is not what you get: Single-family house renovation and energy retrofit seen through the lens of socio-materiality. *Construction Management and Economics*, **35**(5), 276-287.
- Carlile, P R, Nicolini, D, Langely, A and Tsoukas, H (2013) Introducing the third volume of perspectives on organization studies. In P R Carlile, D Nicolini, A Langely and H Tsoukas (Eds.) *How matter matters Objects, Artefacts and Materiality in Organization Studies*. Oxford, UK: Oxford University Press.
- Energimyndigheten and Boverket, (2013) Förslag till nationell strategi för energieffektiviserande renovering av byggnader (Draft National Strategy For Energy Efficiency Building Refurbishment). Eskilstuna, Karlskrona: Energimyndigheten, Boverket.
- Feldman, M and Orlikowski, W (2011) Theorizing practice and practicing theory. *Organization Science*, **22**(5), 1240-1253
- Gluch, P and Svensson I (2016) The organizational nexus of changing management practices for sustainable renovation. In: P W Chan and C J Neilson (Eds.) *Proceedings of the 32nd Annual ARCOM Conference, 5-7 September 2016, Manchester, UK*, 1189-1198.
- Gluch, P and Bosch-Sijtsema, P M (2016) Conceptualizing environmental experts through the lens of institutional work. *Construction Management and Economics*, **34**(7-8), 522-535.
- Hampel, C, Larwence, T and Tracey, P (2017) Institutional work: Taking stock and making it matter. In: R Greenwood, C Oliver, T B Lawrence and R Meyer (Eds.) *SAGE Handbook of organizational institutionalism 2nd Edition*. London, UK: Sage Publications Ltd.
- Jarzabkowski, P, Matthiesen, J and Van de Ven, A H (2009) A practice approach to institutional pluralism. In T B Lawrence, R Suddaby and B Leca (Eds.) *Institutional work - Actors and Agency Institutional Studies of Organizations*. Cambridge: Cambridge University Press.
- Jones, M (2013) Untangling Sociomateriality. In: P R Carlile, D Nicolini, A Langely and H Tsoukas (Eds.) *How Matter Matters Objects, Artefacts and Materiality in Organization Studies*. Oxford, UK: Oxford University Press.
- Jones, M (2014) A matter of life and death: Exploring conceptualizations of sociomateriality in the context of critical care. *MIS Quarterly*, **38**(3), 895-925.
- Kadefors, A (1995) Institutions in building projects: Implications for flexibility and change. *Scandinavian Journal of Management*, **11**(4), 395-408.

- Lawrence, T B and Suddaby, R (2006) Institutions and institutional work. *In: S Clegg, C Hardy, T B Lawrence and W R Nord (Eds.) Sage Handbook of Organization Studies*. London, UK: Sage Publications Ltd.
- Lawrence, T B, Leca, B and Zilber, T B (2013) Institutional work: Current research, new directions and overlooked issues. *Organization Studies*, **34**(8), 1023-1033.
- Lawrence, T B and Dover, G (2015) Place and institutional work: Creating housing for the hard-to-house. *Administrative Science Quarterly*, **60**(3), 371-410.
- Leonardi, P M (2013) Theoretical foundations for the study of sociomateriality. *Information and Organization*, **23**(2), 59-76.
- Monteiro, P and Nicolini, D (2015) Recovering materiality in institutional work: Prizes as an assemblage of human and material entities. *Journal of Management Inquiry*, **24**(1), 61-81.
- Orlikowski, W J (2007) Sociomaterial practices: Exploring technology at work. *Organization Studies*, **28**(9), 1435-1448.
- Orlikowski, W J and Scott, S V (2015) Exploring material-discursive practices. *Journal of Management Studies*, **52**(5), 697-705.
- Palm, J and Reindl, K (2016) Understanding energy efficiency in Swedish residential building renovation: A practice theory approach. *Energy Research & Social Science*, **11**, 247-255.
- Putnam, LL (2015) Unpacking the dialectic: Alternative views on the discourse-materiality relationship. *Journal of Management Studies*, **52**(5), 706-716.
- Raviola, E and Norbäck, M (2013) Bringing technology and meaning into institutional work: Making news at an Italian business newspaper. *Organization Studies*, **34**(8), 1171-1194.
- Smets, M, Morris, T and Greenwood, R (2012) From practice to field: A multilevel model of practice-driven institutional change. *Academy of Management Journal*, **55**(4), 877-904.
- Styhre, A (2017) Thinking about materiality: The value of a construction management and engineering view. *Construction Management and Economics*, **35**(1-2), 35-44.
- Thollander, P (2013) Energy in Swedish industry 2020: Current status, policy instruments, and policy implications. *Journal of Cleaner Production*, **51**, 109-117.
- Thoresson, J (2015) *Omställning-tillväxt-Effektivisering Energifrågor vid renovering av flerbostadshus*. Unpublished PhD thesis, Tema T, Linköping University.