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Citation: Jarzabkowski, P. and Pinch, T. (2013). Sociomateriality is 'the New Black': Accomplishing repurposing, reinscripting and repairing in context. *Management (France)*, 16(5), pp. 579-592.

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ISSN: 1286-4692

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Special Issue

■ Paula JARZABKOWSKI
Trevor PINCH 2013

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M@n@gement, 16(5), 579-592.

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Sociomateriality is ‘the New Black’: accomplishing repurposing, reinscripting and repairing in context

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Abstract

This paper addresses the trend towards sociomateriality in the social sciences generally and management and organization studies specifically with a critique of two main approaches: affordances and scripts. We suggest that if sociomateriality is to be more than a fashion and become an enduring lens through which to understand social phenomena, it needs to go beyond its current preoccupation with the intentions encoded in the objects or materials themselves to examining activities as they are accomplished with objects in a multiplicity of contexts. To support our discussion of accomplishing activity in context, we examine the notions of repurposing and reinscripting objects inherent in the literature, to which we add a third concept of repairing. These ‘three Rs’ are advocated as a research agenda for sociomateriality in management studies and the wider social sciences.

Keywords: sociomaterial, materiality, sociotechnical, practice theory, affordance, script, repurposing, reinscripting, repairing

INTRODUCTION

Like fashion, management theory is prone to trends (Abrahamson, 1991; 1996). A Google-n-gram search displays a trend for 'materiality' with a marked rise in the term since the mid-1980s, indicating a generally increasing interest in how the material properties of things are implicated in different situations. This interest is broad, covering a range of social science disciplines, including anthropology (Miller, 2008), archeology (Meskell, 2008), the sociology of finance (Beunza & Stark, 2004; MacKenzie, 2008), communication theory (Leonardi & Barley, 2011; Robichaud & Cooren, 2013), and science and technology studies (Pinch & Swedberg, 2008; Suchman, 1987). Indeed, almost everybody is interested in it, though some notable 'hold-outs' are evident; it appears, for example, that mainstream sociology has yet to embrace this agenda, as only one paper has been published in the *American Journal of Sociology* using the term 'materiality' in the title or abstract. Given the increasing popularity of materiality and sociomateriality in management and organization theory (e.g. Carlile, Nicolini, Langley, Tsoukas, 2013; Jarzabkowski, Spee & Smets, 2013; Leonardi & Barley, 2010; Orlikowski & Scott, 2008; Vaara & Whittington, 2012), we probe some existing theoretical approaches and their implications for developing a more robust research agenda in this area.

Our intention here is not to provide an extended review of the sociomateriality literatures; that would stray beyond the scope of this positioning paper. Rather, we point to the popularity of sociomateriality in a number of related management fields, from accounting to strategy and technology, as an indication that it is indeed 'the new black'¹. Our aim is to go beyond the predominance of conceptual themes in an effort to give greater substance to the way that scholars can think about, understand and disentangle sociomateriality in their study of empirical contexts. We suggest that if sociomateriality is to be more than just a fashion—here today, gone tomorrow—it will need some robust and empirically analyzable concepts to give it greater persistence.

In particular, sociomateriality has become increasingly 'trendy' in management theory, with two positioning papers in the influential *Academy of Management Annals* exhorting scholars to examine the sociomaterial aspects of technology and organization (Leonardi & Barley, 2010; Orlikowski & Scott, 2008), and a third emphasizing the centrality of materials within the communicative constitution of organizations (Ashford, Kuhn & Cooren, 2009). Increasingly, articles in management journals highlight the role of materials in identity work and sensemaking (e.g. Oliver & Roos, 2007; Stigliani & Ravasi, 2012), point to the prevalence of visual aids, analytic tools, and software in strategy-making (e.g. Faure & Rouleau, 2011; Kaplan, 2011; Whittington, Molloy, Mayer, & Smith, 2006), and emphasize the materializing of discourses within texts (e.g. Cooren, 2004; Balogun, Jacobs, Jarzabkowski, Mantere & Vaara, 2014; Vaara, Sorsa & Palli, 2010).

On the one hand, such studies acknowledge that actors, objects and intentions are entangled in a complex bundle of practices (Callon & Law, 1997; Jarzabkowski & Spee, 2009; Leonardi, 2011; Orlikowski, 2007). On the other, management scholars often struggle with ways to integrate actor and object within unfolding practice. For example, reflecting on the field of technology studies, Orlikowski and Scott (2008) criticize the dominant view that separates technology and human activity at an analytical level, thus

1. "Red is the New Black", *US Vogue*, August 2006; "Grey is the New Black" *Vogue Korea*, September 2008. "For Lego, Pink is the New Black", *Business Week*, February 2013. Attributed to a range of fashion icons, the term 'the new black' has become common and now includes business fashions and trends as well as purely sartorial tendencies.

treating them as two entities that interact (see also Feldman & Orlikowski, 2011; Leonardi & Barley, 2010). Leonardi (2011) explains engineers' attempts to reconcile human agency with a technology's material agency as complex imbrications (Taylor, Groleau, Heaton, & Van Every, 2001), or arrangements, of human and material agency that constitute affordances upon the unfolding activity. That is, depending on their arrangement, these different agencies can transform either the technologies or the actors' everyday work routines. Yet, even though such studies acknowledge the complex, mutually constitutive and shifting arrangements between actor and object within the unfolding activity, they still separate material and human agency. This article therefore aims to explore some of the underlying principles of sociomateriality in order to provide insights for both management scholars and those studying sociomateriality in wider disciplines. We engage particularly with a longer tradition of sociomateriality within the field of science and technology studies as a way of examining the value of different approaches. Within science and technology studies the approach of 'scripts' has been extremely influential as a way of conceptualizing how humans interact with technology. But we will start our examination with a wider and even more influential approach known as 'affordances'.

The paper is structured in the following way. We first outline and contrast two main views of sociomateriality that we term the 'affordances' and 'scripts' approaches; we then explain their varying implications for research, before advocating another way of thinking about materiality based on accomplishing materials and activities in context. We shall use this 'accomplishing' approach to advocate the three R's of a research agenda for sociomateriality: repurposing, reinscripting, and repairing. Sociomateriality refers to 'the constitutive entanglement of the social and the material in everyday organizational life' (Orlikowski, 2007: 1438). Because of this mutual constitution, sociomateriality is often simply termed 'materiality', since, ontologically, the social is so implicitly entwined with the material that distinctions between the two are artificial (e.g. Leonardi, Nardi & Kallinikos, 2013). However, for the purposes of this paper, we use the term 'sociomateriality' because it so firmly instantiates the social in the material for those less steeped in this ontological approach. Taken seriously, sociomateriality is more than simply a fascination with the 'things' that shape or are deployed within human action, as can be seen, for example, in recent research into artifacts and boundary objects (e.g. Star & Griesmer, 1989; Bechky, 2003; Cacciatori, 2012; Carlile, 2002). Rather, it is a serious attempt to understand how human bodies, spatial arrangements, physical objects, and technologies are entangled with language, interaction, and practices in the doing of activities (Pickering, 1995; Schatzki, 2006).

THE AFFORDANCES APPROACH

Gibson (1986) developed an ecological approach towards affordances, suggesting that particular objects, such as tables, chairs, and surfaces, have affordances that go beyond their purely physical properties; for example, being made of wood or metal of a particular density or type. As Zammuto et al (2007: 752) note, the matter of the material properties 'of an object favors, shapes or invites, and at the same time constrains, a set of specific uses'.

Importantly, these additional properties—affordances—emerge in relation to the activities of those using the objects. For example, a card table may afford support for a mouse to stand upon it but not an elephant, although the physical properties of the table do not change at all in either situation. That is, material affordances are relative to the situation in which they are used (see also Hutchby, 2001). In short, affordance is a relational property, as is made clear by Faraj and Azad (2012). Norman (1990) has applied this concept in the field of technology studies by suggesting that the affordances of an object are often designed into the object. For example, the slot in a slot machine invites the insertion of a token or coin. We might also consider that the user of the object recognizes these design properties and hence both the affordances and inbuilt limitations of design. For example, while the driver of a Smart Car would willingly use a bridge at a minor creek crossing, the same driver at the wheel of a large truck would not.

Affordances are thus a term for understanding how humans interact with the material world. Going beyond Norman, any object may afford multiple possibilities that are beyond those purposes for which it was designed (Faraj and Azad, 2012). That is; an object may be repurposed in situated human interactions (David and Pinch 2006). For example, a chair affords more activities than the designed purpose of sitting, such as being repurposed as a step for reaching a high object, as a lock under a door handle, as firewood when broken, or even, imaginatively, as a shield for modesty, as so aptly illustrated in Lewis Morley's iconic 1963 photo of Christine Keeler in the aftermath of the Profumo affair. Yet, such repurposing, while enabled by the many creative impulses of human action, is not infinite (Hutchby, 2001); that is, no amount of creativity can permit a toaster to be used as a cell phone (Pentland & Feldman, 2008: 243; see also Leonardi, 2011).

As one of the few terms we have for describing how the human and material worlds are linked, affordance is an incredibly useful concept (Pollock, 2012). For instance, in information science it can act as a useful shorthand for capturing the functionality which the internet gives users—the possibility of having instant connectivity with remote users, the ability to copy and paste text, and so on (e.g. David & Pinch, 2006). There are two problems with the term. First, the word itself, with its economic overtones, is a 'weasel word'; I can afford only one dollar to do something—yes, that one dollar constrains my action, but not in a precise way. Invested wisely, that dollar may become a hundred dollars; spent foolishly, it may amount to nothing. The 'affordance' of something is not a very precise way of capturing the properties of an object for social interaction. The second problem is that affordances, perhaps because of their association with Gibson's original formulation of the term, give too much power over the types of social interaction permissible to the object doing the 'affording' (Faraj and Azad 2012). Often an affordance is simply equated with the 'function' of an object, such as the fact that the function of a chair is for sitting. The function of the object not only delimits the agency of the object but also ascribes a fixed intention or motivation to the person using the object. Thus a chair is for sitting on and people, when they interact with a chair, have the unambiguous intention of sitting on it.

Even if it is acknowledged that an object may be repurposed and hence acquire a new function, the focus is placed upon this new function and the new intention

entailed rather than on the social nature of the interaction and what activities it is accomplishing. Again, this seems to be related to an 'affordance' conjuring up an economic value on the part of objects that predisposes a focus on what purposes they can and cannot afford—similar to the notion that with \$1, I can afford this but not that. For example, Hutchby's (2001:452) reinterpretation of the Grint and Woolgar (1997) case of a user who is flummoxed by a computer printing cable that just will not plug into a printer (according to Hutchby this is explained by the affordance of the plug—it is only compatible with an earlier model of the printer) directs us to focus less on the textual interpretation of materials than on their underpinning 'material substratum', which provides an 'array of affordances'. Yet, as Bloomfield, Latham & Vurdubakis (2010: 422) emphasize in their study of the affordances of equipment for disabled people, 'the "affordances" of technological object and the effectiveness or action capabilities of human agents should not be viewed as a given but emerge as situated, and indeed ongoing accomplishments' (emphasis in original). The problem, however, is that the term 'affordance' can invite scholars to generate laundry lists of the possible affordances in objects, which also implies laundry lists of intentions and misdirects attention from the social accomplishing of activities in which such objects are entangled.

THE SCRIPT APPROACH

Another influential way of thinking about material objects arises from Actor Network Theory (ANT). Our purpose in this paper is not to engage with ANT in its entirety but to draw out a particular interpretation of materiality contained in its notion of scripts (Akrich, 1992). Taking a semiotic approach, Akrich & Latour (1992) instantiate action more firmly into the notions of design and purpose than might seem available in the concept of affordance. Specifically, they posit the notion of material scripts involving sequences of action. From this perspective, materials are inscripted with particular purposes by designers and these purposes prescribe the possibilities of the materials (what they do and do not afford); human and non-human actors then subscribe to these through their reactions to the scripts encompassed in the material. The material thus scripts, or inscripts and prescripts, a sequence of actions such as doing up the seatbelt in a car before driving in order for the car to start. Therefore, we might expect that actors will subscribe accordingly with actions that are shaped by the purposes imagined within the material script. Yet actors may subscribe to the technology in novel ways, such that by reinscripting it; for example, inserting chewing gum into the seatbelt locking mechanism will enable the car to be driven without following the prescribed action sequence. The reinscription of a technology is acknowledged by Latour and Akrich and described as a battle between what Latour calls 'programs' and 'antiprograms' (Latour 1992). The car manufacturer will try to 'program' the driver to wear the seatbelt and the driver will produce an anti-program (the chewing gum in the slot) to overcome the original program. This way of analyzing how humans interact with material objects, however, seems to work only for sequential series of actions where clear functionality is imputed to the technology and the actors concerned. It is rather the same problem as with affordances: scripts are underwritten by equating lists of functionality to objects and intentions to actors. Thus, car manufacturers intend to supply seat belts to restrain drivers

and the functionality of the seat belt is to restrain the driver; the driver has the intention of overcoming this restraint, and the car manufacturer responds by providing a 'program' (the warning system) to overcome the users' reluctance to belt up. The driver, in turn, intends to overcome this 'program' with the chewing gum (the anti-program), which has the functionality of emulating the seatbelt attachment being correctly seated (and hence turning off the warning system). Lists of functions and intentions (or motivations) are again at the center of this sort of analysis. But this does violence to the complexity of the situation. The intention of the car manufacturer is surely more complicated and may have to do with legal mandates and requirements, the desire to sell more cars, and so on. Similarly, users may have complicated and contextual reasons for their actions. The difficulty with the script approach becomes even more apparent when we consider the complicated social situations within which most material objects are embedded, where it is hard to discern sequences of actions and impute functionality and accompanying intentions.

Without a doubt, objects within a particular sociomaterial setting can have a particular social valence that invites scripted behavior. For example, a shopping bag can inscript particular actions within a selling context: the provision of the bag at the grocery store checkout invites actors to fill it with goods that are deemed to have been purchased. Normatively, these goods now have a different status than the ones remaining on the shelves. But this material script is very contextual; the bag in other sales contexts, such as its use in market pitching, where bags are given out before goods are purchased (Clark and Pinch 1995, Darr and Pinch 2013), means something else. It is a way of inveigling people into purchasing by inverting the social obligations and material scripts found in the normal grocery store. Furthermore, the 'carrying' or 'containing' properties of a bag extend well beyond the shopping context, as seen in the little plastic bags of tea, coffee and soft drink sold in Asia, where a bag's carrying properties can be reinscripted to turn it into a drinking vessel. Breathing into a bag during a panic attack may reinscript it as a temporary medical device for containing and enabling the reabsorption of carbon dioxide. In short there, is no one 'bag script' and, as with affordances, we seem to be reduced to producing laundry lists of functions and appropriate user scripts (which have user intentions embedded in them).

From an ANT perspective, the materials are themselves actors that inscript the possibilities for action. It could be argued that the bag, say, has some specific actions, some features or functions of 'bagginess' such as carrying and containing, inscripted into it that shape what we are expected to do with it. We suggest, however, that it is important to assert the social and creative nature of human action more strongly. For example, even the containing properties of a bag are not a given, since a bag might equally be turned into a Halloween mask by cutting holes in it that significantly hinder its capacity to carry and contain. It seems odd to adopt the language of programs and antiprograms here. Such activities do not 'reinscript' the bag in order to circumvent its designed properties but rather show that the bag enables different forms of social interaction within the Halloween context. While materials cannot be put to all purposes, it is important to note that there is also very little essentiality in the actions inscripted in many materials, such as a bag. The bag may mediate many possibilities but the social situation is the key to understanding how most 'material scripts' are manifest (Darr and Pinch 2013)

THE 'ACCOMPLISHING' APPROACH

Thus far we have introduced the notion of affordances, which provides us with the idea of material purposes and their repurposing, thus predisposing us to understand the specific properties that materials bring to social interaction. We could almost say that this notion provides us with a functionalist view: as actors, we can use things according to the purposes they afford. We have also introduced the notion of material scripts, which firmly instantiates action into materials, albeit at the risk of giving materials properties that allow them to use us, through the way that they inscript and prescribe sequences of actions to which we subscribe or which we reinscript. To this extent, we suggest that, while material scripts have a stronger focus on action, both theories tend to 'black box' the social interactions within which activities are accomplished in order to focus on the materials themselves. Yet materials are implicitly entangled within the everyday actions of human actors interacting with things (Bloomfield, Latham & Vurdubakis, 2010; Jarzabkowski, Spee & Smets, 2013). It is this aspect of social interaction with materials that we now wish to explore further in order to complement the previous views of affordances and scripts we have introduced. We call this the 'accomplishing' approach, to acknowledge that activities are accomplished with materials, and use it to introduce the 'third R', which we label repairing.

What to do with a Limp Clipcard

While inscription and reinscription place materials in the context of action, we assert that a stronger insight into the activities being accomplished within a multiplicity of contexts is essential to render materials visible in interaction. For this purpose, we recount an anecdote from one of our own experiences of breaching the script for interacting with a specific device. We refer to the machine for clipping what are known as prepaid 'clipcards' or 'stripcards', which are common on public transport in Denmark and the Netherlands. Our story begins with Trevor, who has purchased a clipcard and has used it successfully for his previous three days' travel. He has one last journey to make to Copenhagen Airport and enters the subway system knowing he has enough rides left on his clipcard. On entering the station he assists a woman who is struggling to push her pram into the elevator leading down to the platform. Once on the platform, he tries to use his clip card, but the machine will not take it: his clipcard has become limp from being bent over in his wallet. He struggles with the machine before the woman he has helped earlier comes to the rescue. Noting his plight, she shows him smilingly what to do. Spit on his clipcard! He does exactly that and, lo and behold, the machine accepts the card and he is able to complete his journey. He thanks the woman profusely and she is of course grateful that she has been able to return his earlier kindness.

What do we make of this vignette, this little ethnographic encounter with machines? The normal use of the clipcard seems to be a classic case of following a Latour-Akrich script. But a crumpled or limp card breaches the material script for which both card and machine have been designed and which are necessary parts of the sequence of actions to legally board the train. At its most fundamental we see that the actions of the woman are in

repairing the script, which had been breached by the breakdown of the interface between the card and the machine. That is, the designed affordances that enabled connection between the clipcard and reader had broken down, thus preventing the material script of actions encoded within them. Yet we see neither repurposing nor reinscription in the woman's knowledgeable behavior. Rather, she simply uses other material possibilities, such as moisture, to repair the affordances contained in the materials and enable the material script to progress. This is in no way exceptional; the woman knew exactly what to do as a practical everyday behavior to enable action to continue. We thus assert that repairing is itself an important conceptual extension to consider in understanding the situated interaction between the social and the material (Jackson 2013).

But we need to look beyond the specific instance of repair to really understand materials in context. We cannot understand this social activity of accomplishing the boarding of a train if we do not consider the multiplicity of context and action implicit within it. First, the very act of repairing is uniquely situated within its cultural context; regular users of the Copenhagen public transport system know that this problem can arise and how to fix it. Second, the action was facilitated by the social interaction that preceded it—the materiality of the tram and elevator through which the association was brought into being and which facilitated the woman sharing her tacit cultural knowledge of how to repair a perceived breakdown of human and material interactions (not to mention conventional gendered notions of politeness: would Trevor have as willingly helped a man struggling with a huge keg of Tuborg?). Third, which material affordances and scripts should take priority in explaining this incident: the tram; the elevator; the clipcard; the wallet in which it became crumpled; the ticket machine; the boarding of the train; or the broader Danish context within which the design of the clipcards, their possible breakdowns, and their knowledgeable repair are entangled? Of course, none can take priority. They are all part of accomplishing an activity with materials (Callon & Law, 1997; Jarzabkowski et al, 2013; Suchman, 1987). In order to focus on and explain the specific instance of repair we must necessarily explain the broader activity and surrounding materials within which that instance is situated, and without which it may not have occurred. Even the intentions of the actors are not always clear. We impute that both actors in this encounter intended to help each other on their journey, but maybe their intentions were less clear. Maybe they intended to fall in love as in classic movie stories of chance railway encounters. In such a scenario the spitting on the clipcard might mean something else altogether. Furthermore, not only is repair not unique to those doing the repairing activities, but also humans routinely repair defects in machines in order to live with them (e.g. Orr, 1996; Suchman, 1987). One of the most obvious current examples is the failure of voice recognition software, such as Siri, used on the iPhone to recognize the correct words. In this case the 'affordance' is provided by the software/hardware combination, which constitutes a speech recognition system. The affordances built into Siri are simply not good enough to handle the complexities of natural language. We do 'repair' in this sense on human computer interaction systems all the while in order to make them somewhat useful to us (Collins 1990, Dreyfus, 1972). That is, repair is often at the heart of accomplishing activities with materials, as part of the practical coping involved in accomplishing a task in situ (e.g. Orr, 1996; Suchman, 1987). We thus assert

that the materiality agenda will be best served by situating materials within the accomplishing of activities in multiple contexts (Schatzki, 2002). It is these contexts and activities that best explain the interaction of the social and the material (Bloomfield et al, 2010) rather than any innate or transformative properties of the materials themselves (Jarzabkowski et al, 2013; Pentland & Feldman, 2008).

TOWARDS A RESEARCH AGENDA

One of our aims in this short paper has been to probe the trend towards sociomateriality in order to offer explanations of what might take it beyond fashion as 'the new black' to persist as part of an enduring explanation of social phenomena. Increasingly, those scholars at the forefront of sociomateriality as a lens in management studies lean towards the accomplishing approach that we advocate. They exhibit this preference, for example, by examining the materialization of what 'matters' through the way that specific objects are constituted within communicative interactions (e.g. Robichaud & Cooren, 2013). Yet one of the problems for research in sociomateriality, and practice theory more generally, has been how to render everyday materials visible as objects for study (Jarzabkowski & Spee, 2009) given their tendency to fade into the background and to be taken for granted within practical action (Pinch 2011). For example, if you asked someone to explain how to use a clipcard, they would be unlikely to mention the need to spit on it after it has become crumpled in a wallet. In this paper we have examined two dominant approaches to materiality, which we termed the affordance and the scripts approach. Whilst noting their limitations in black-boxing the social context, we noted that their concepts of repurposing and reinscripting provided some important insights into social and material interactions. We then added a third lens, of accomplishing activities with materials, which firmly emphasizes the entanglement of the social and material within a multiplicity of contexts that constitute different social obligations, affordances, scripts and possibilities. In doing this, we also drew out a third R for sociomateriality research: the notion of repairing. In our terminology, 'repair' is used in the sense of restoring the original affordances and scripts to objects, but it could be given a wider meaning whereby repair itself is used to repurpose objects (Jackson 2013). We suggest that research should aim to take an 'accomplishing' approach to the repurposing, reinscripting and repairing of the social and the material as they occur within practical activity. These three Rs all note the mutable and implicitly social nature of materials in different ways. All three can be studied by examining how activities are accomplished with materials in multiple contexts (Schatzki, 2002).

By taking an accomplishing approach that focuses on activities, scholars will be able to go beyond some of the methodological problems inherent in an excessively dominant focus on the materials themselves and their affordances and, hence, non-affordances. In particular, we avoid the trap of assuming the object has specific functionalities and intentions implicit within it (see also Robichaud & Cooren, 2013). As we explained, a bag has much to offer beyond its design purposes or even, potentially, our imagination. While there is not infinite variation here, there is more variation than we may first imagine until we understand it in the social context of activities, such as

finding a cheap and effective drinking vessel in Asia, fashioning a medical device in an emergency, or making a Halloween mask for a children's party. The accomplishing approach also avoids the philosophical trap of pursuing materiality by postulating new forms of ontology and ways of 'interacting' without humans, such as those suggested by Karen Barad (2007) and others. That Barad in effect makes sociology subservient to physics shows the danger of an over-reverent approach towards materiality (see Pinch 2012). Excursions by management scholars into the esoterics of quantum mechanics or suggestions that the 'good life' is to be found in physics (Bergmann 2012) are, we suggest, best avoided.

At the same time, an accomplishing approach goes beyond the routine behaviors implicit in material scripts and their assumed sequences of action (Pentland & Feldman, 2008), which may make us blind to the possible improvisations until a breach, absence or disruption occurs that occasions the repairs that make habitual action visible (see also, Jarzabkowski, Le & Feldman, 2012). For example, do we seek to understand the culturally situated activity in the clipcard until we see how its assumed properties and scripts are breached and repaired? Until then, it is just a ticket system, which is too mundane for us to notice how it shapes more fundamentally situated, cultural, political and socio-economic factors, such as our assumptions about the efficiency and economic exchange involved in travel. To extrapolate further, we are often blind to our contextually bound assumptions about materials. If we do not see the multiple possibilities that go beyond our usual conceptions of, say, a bag, then what other critical possibilities do we also miss in, for example, the gendered, racial or socio-economic nature of materials and scripts, that carry assumptions of inequality and division? If we are to make sociomateriality an important and central agenda in management research specifically and social science research more generally, we must enable materials to take centre-stage in situated activity (e.g. Suchman, 1987) and explore the assumptions and social obligations that surround them, keep them working and, if need be, enable change. The framework of repurposing, reinscripting, and repairing advanced in this paper may help scholars to keep the social accomplishing of activity with materials at the heart of that research agenda.

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Acknowledgements

The authors acknowledge the helpful comments of Olivier Germain and Viviane Sergi in developing this paper.

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