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Laundry power and care: Relational materialism, temporalities and spatialisation of communal laundering

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ABSTRACT

Laundering activities enact a range of socio-material relations and spatialisation of infrastructures such as provision of machines, water, energy, laundry and lately digitalisation. Drawing on a case study on communal laundry facilities in Sweden, this paper focuses on socio-material relations and explores laundry practices in Swedish rental housing, aiming for a theoretical contribution in the field of care, which could incorporate spatial and temporal aspects to be more inclusive. Theoretically based in topologies of power, with sensitivity to processes of spatialisation and temporalities, the analyses show how decisions about design, space and technologies influence everyday life of tenants. The paper illuminates how availability and access to laundry facilities were conformed and individualised to reach expected standards. Laundry spaces were subject to digitalisation and automation technologies introduced to meet efficiency and environmental demands and handle perceived problematic tenant practices. Conclusions are that relational materialism in the field of care and scripting processes would benefit from explicitly including theoretical thinking about space and temporality, conceptualised as choreography. The approach "thinking with care" brought backgrounded laundering phenomena to the fore and pointed out laundering as a matter we should care about. Digitalisation and automation facilitated control of shared laundry spaces and ambitions to individualise laundry made private spaces, such as bathrooms, more attractive to host laundering activities but backgrounded social dimensions of communal laundering.

1. Introduction

Material infrastructures and technologies of homes and their connections to systems for provision and associated organisations have been described as hybrids (Shove, 2018) and parts of scripting processes (Akrich, 1992) to programme objects to perform activities in certain ways. Hybrids and scripts are not neutral or unbiased but loaded with norms, values and ideas about how daily life should be performed and fit into existing power networks. Strengers (2009), drawing on Akrich (1992), gives the example of a washing machine which scripts "a range of methods or 'cycles' used to produce appropriate clean laundry" (Strengers, 2009, p. 45). When Shove (2003) studied laundering as a part of social practices of cleanliness and convenience in homes, she highlighted the influence laundry technologies have on our everyday lives, both the activities we perform and our own understandings of what clean and dirty laundry means. The practices we take for granted in quotidian life should continuously be scrutinised to illuminate what power is present and how it works in the mundane. When spatial and temporal dimensions are part of a framework designed to analyse power, the analysis might give a more inclusive and diverse picture of how power is imbued in everyday activities.

In this paper power is understood as topological (Murdoch, 2006, Allen, 2016) which implies "… quieter registers of power […] often holding together formations that can be used to influence the will or shape of others …" (Allen, 2016, p 2). As our material world changes and relations between humans and non-humans change, power continues to be a key element, but might take new shapes and forms and might be executed from a distance. To explore these new shapes and forms and how power find reach in the mundane, an everyday activity like laundering could be examined in more detail. In the centre of the present research is theoretical understandings of care (Mol, 2002, 2008; Buse et al., 2018). In human geography care has been acknowledged in academic work on space and relationships in care situations (Milligan, 2001; Conradson, 2003a; Conradson, 2003b; Bowlby, 2012; Munro, 2013; Bowlby and McKie, 2019). The lion's share of this research has elucidated care as activities involving people's work at home and in different organisations taking care of other people, for example health and social care as informal or formal activities. Care in the present paper

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is conceptually guided by the writings of Mol (2008) and Law (2010) and understood as "a set of materially heterogenous practices involving not simply particular kinds of subjectivities, but also instruments, and technologies together with other material elements, texts and inscriptions" (Law, 2010, pp. 66-67). Mol (2008) discussed care practices in detail in her seminal work "The Logic of Care: Health and the Problem of Patient Choice". Care practices in a health service context might be more self-evident, but the idea of directing attention to the doings of those involved in care practices and the shared responsibility of all involved parties to "experiment, experience and tinker together – practically" (Mol, 2008, p. 65) could be applied more generally in socio-material research. In contrast, we can think of technology and pre-defined fixed instructions predetermining how to perform a specific task, without considering all possible variations in practices. Topologies have previously been part of scholarly work in "matters of care" (Law and Mol, 2001), but this paper suggests that thinking about power, space and time more explicitly in power topologies, as suggested by human geographers (cf. Murdoch, 2006, Allen, 2016), could advance the academic field of care.

With this theoretical foundation, care for laundering is in focus as a socio-material spatiality, enacting practices and relationships in laundering. When care practices are foregrounded in Swedish rental housing laundry work the boundaries between private and public are blurred and crossed. A tenant using communal laundry facilities in Sweden does it partly in private, partly as a member of a collective of tenants in a block of flats with certain responsibilities and expectations, for example: leaving the facilities in the state you would like to find them (Lund, 2009, 2011). This approach highlights the many different versions of laundering that are present when subjects and objects are enacted, as various fabrics such as clothes, towels and linen are managed as laundry in and around homes.

The involved practices of laundering create relationships between the involved subjects, objects and spaces, which could all be understood as multiple and fluid, and in constant making (Waitt and Welland, 2019). The relationships are also part of topologies of power (cf. Murdoch, 2006, Allen, 2016) which make power reach into daily life from a distance. The constant making of relationships and their integration with topologies of power constitute the overarching research interests in this paper. The aim is partly empirical and to explore laundry practices in Swedish rental housing and partly aiming for a theoretical contribution in the field of care, which could incorporate spatial and temporal aspects to be more inclusive.

2. Background

Shove (2003) suggested that laundering consists of materialised cleanliness which holds "moral, social and symbolic meanings" (p. 119). Drawing on Strasser (1982) and taking a historical perspective, laundering has according to Shove (2003) increasingly become a matter of household devices and products, resulting in a "corporate grip on the meaning of cleaning, […] within the heart of the home" (Shove, 2003, p. 121). The Swedish situation, historically influenced by a strong welfare state combined with recent influences of neo-liberalism in several sectors, shows similarities to the British case as described by Shove (2003), the situation in the U.S. (Strasser, 1982) and Australia (Waitt and Welland, 2019). Laundering in Sweden is strongly associated with housing, which is a concern both for Swedish municipalities providing rental housing with laundry facilities within their geographical jurisdiction, and private developers and property owners who provide housing and laundering based on demand. Laundry appliances and consumer goods such as detergents are sold and bought on the regular consumer market.

Tenants' access to communal laundry rooms and facilities in Sweden have at least partly slowed down the processes of making laundering largely a corporate business. Municipal housing companies, and also private housing owners and co-operative housing associations, have in many cases provided communal laundry rooms and separate laundry buildings in backyards or courtyards. These spaces particularly dedicated to washing and drying of household fabrics hold certain materialisations and spatialisations of cleanliness, as defined and expected by the property owner, be it municipal, private or co-operative associations. Care for laundering in this example includes cleaning the communal laundry space, removing fluff from the tumble drier and wiping the washing machines clean when you are done with your laundry. Berner (1998) traced the historical processes in Sweden leading to the current situation and claimed "a preoccupation with one's own home, its planning, construction, and furnishing, underwent an expansive growth around the turn of the [20th] century" (p. 319). The responsibility was directed towards Swedish housewives and a programme based on aesthetic, moral and hygienic values was rolled out. Spatial and temporal organisation was part of the programme, and the ordering of things and everything in its place dominated the message from authorities.

Shove (2003) proposed a model of "systems of systems" to describe how households manage their laundry and fix issues related to laundering, while simultaneously manufacturers and producers of goods and services in the "laundering business", such as household detergent, and fabric and textile industries are trying to develop their products, find new markets and win shares of markets. Taken together, laundering involves many different people, social groups and organisations acting on different levels of respective systems. In Sweden, the housing companies and landlords providing facilities for laundering offer yet another interest group, managing laundering and using different means of control to influence how laundering is performed by households. Housing companies and property owners thus have their own "system" within the *meta*-system of laundering, making the co-production of laundering more complex in the Swedish case.

Allon and Sofoulis (2006), Heynen et al. (2006), Mee et al. (2014) investigated rental housing, the socio-material configurations of systems for provision, use of resources and how these entities, relations and flows shape urban space. Owner-occupied housing is a more common empirical focus in research, but rental housing could elucidate issues related to justice, vulnerability and expectations on people in homes, in which they have little or no possibilities to influence the material standard. Mee (2009) acknowledged tenants as resourceful, skilful and able to care for their homes, but often constrained by the tenure in their actions. Tenants are connected to systems of provisions via various interfaces at home: power plugs, pipes and drains, meters and bills, and can often enjoy the convenience and comfort of what might seem to be an endless supply of water, electricity, gas, etc (Sofoulis, 2005). But the power to design, construct, manage, repair and redesign the system of provision is not in the hands of renters. Nor are the goods and services around these systems, such as water, electricity, gas, heating, but these elements are:

> "critical dimension[s] to the social production of space […implying] a series of connectivities between the body and the city, between social and bio-physical systems, between the evolution of […] networks and capital flows, and between the visible and invisible dimensions to urban space." (Gandy, 2004, p. 373)

Rental housing is connected to systems that might make everyday life both easier and more difficult for tenants, depending on individual prerequisites and circumstances, but many parts of the system are acting from a distance and out of their control (cf. Allen, 2016). Communal laundry facilities that are shared by neighbours in the same building or same block of apartments are central features in Swedish rented flats, which make up almost one third of all housing in Sweden. The provision of modern washing and drying equipment in Swedish public housing evolved parallel to other household work and comfort-related facilities, such as kitchens and central heating (Berner, 2002). The Swedish welfare model and the political vision of "peoples' home" were manifested

by a Swedish prime minister in the 1930's and put into policy over the following decades. Washing and drying facilities to enable laundering are included in the rent and usually not billed separately or charged by number of uses. Access to the laundry facilities is managed by self-serviced booking systems that are designed to divide laundering slots equally between tenants. Compared to consumer laundering white goods, such as washing machines and tumble dryers, the equipment in communal laundering spaces has an industrial design to manage many washing and drying cycles every day. The cycles are shorter than consumer white goods and the economic incentives to reduce water and energy demand lie primarily with the property owner.

3. Understanding laundering as matters of care in topological space

Relational approaches to the description and analysis of power have become predominant in many academic fields, including human geography. The relationships, interconnections, links and ties are all important in our efforts to understand how and why different phenomena are present or absent the way they are. Relationality also calls for a certain view on power, "as a dynamic web of interconnections" (Braidotti, 2006, p. 199). An analysis about how these dynamics find balance, or move and change, will show what is enacted, brought into the web or pushed out. Mol (2002) proposes a research approach focused on phenomena as "multiple", highlighting that different "versions" could be present at the same time. According to Mol (2002), "enactments" of different versions should be the centre of attention in research, along with the processes that bring some versions to the fore and render some absent. Significant for these relations are heterogeneity and fluidity.

The specific concept *care* is selected as part of the analytical framework to guide our understanding of communal laundering and power relationships. In recent decades, care has been found relevant in explorations of clinics and homes, for example (Mol et al., 2010), and is part of:

> "a feminist approach that engages with care as a way to draw attention to the significance of practices and experiences made invisible or marginalized by dominant, 'successful', forms of technoscientific mobilization" (Puig de la Bellacasa, 2015, p 692).

Laundering could serve as an example of how technologies such as electronics and mechanical parts of a washing machine are acknowledged in supranational directives about product design and energy efficiency, or chemicals in detergents and fabric conditioners are subject to environmental protection management, labelling and legislation (cf. Eidenskog, 2015). The work, time and effort involved in doing the laundry, which were among the motives behind the inventions of washing machines and tumble dryers, are not as visible in the current public debates, but still present in people's everyday lives (cf. Schwartz Cowan, 1983, 1999). Care as an inclusive analytical concept could help us shed light on how subjects and objects are enacted and brought into the power web of communal laundering.

Even if care has been found rewarding as a research approach and concept to explore together with empirical material, care has also been criticised for the broadness and lack of concept definition (Mol et al., 2011). Could anything be analysed as care? Where and why is care present? In a response to the objections about how care has been presented and used in research, Mol et al. (2011) replied:

> "[…] we sought to ask a how-questions: how is 'care' being done? Which modes and modalities of 'caring' may we trace in various practices? How can each of these, different as they are, shed light on and help to specify the others? Or, in other words, […] 'care' [is] a verb, and not a noun." (Mol et al., 2011, p. 84).

In earlier work, Mol and Law (1994; Law and Mol, 2001) connected their own stance in science and technology studies (STS) based in philosophical process ontology, to ideas about space and spatiality in human geography. Mol and Law (1994) introduced a topology consisting of *fluid space* in which human and non-human entities are in constant movement and change, becoming entanglements and forming socio-material spatialisations. Fluid space and fluid spatiality were suggested as concepts to capture topological space in a version where connections and shape change gradually and incrementally. Thus, transformation is constant and "the associations or forms of attachment shift and move, but they do so in a way that also allows the performance of continuity" (Law and Mol, 2001, p. 614) – creating stability and amendments simultaneously. Law and Mol (2001) also introduced *fire space* – elaborated by Law and Singleton (2005) – for exploring entities "in the form of a dancing and dangerous pattern of discontinuous displacements between locations that are other to (but linked with) each other" (Law and Singleton, 2005, p. 347). In fire space, the continuity of shapes and forms is defined by discontinuity and different versions in other places. This notion is connected to how fire space makes different versions of entities present and central, and other versions absent, while still influencing central entities' multiple juxtapositions (Wittock et al., 2017). The question of how different versions of phenomena are made present or absent has previously been empirically explored by, for example, Kortelainen (2010), Eidenskog (2015) and Lindén (2016).

The relational materialism as presented by Mol and Law (1994) and Ingold (2008) stressed relations as not only connection points, but flows creating something qualitatively different. A clothing item, for example, is constantly degraded and broken down by chemical processes in the air, by the sun and in the water, when being washed or soaked, and when in contact with human bodies and other non-human entities. The item's relations to bodies and other entities entail mixing of shapes and smells, thus changing the clothing's value from one laundry category – clean, to another – dirty.

Care illuminates the interdependencies of entities as part of relationships in everyday activities. The experiences of these interdependencies should be brought to the fore and acknowledged for their embodiment, situatedness and temporality, making materiality and space–time relevant to explore as they are articulated and practised (cf. Haraway, 1997; Mol, 2008; Bowlby, 2012). Munro (2013) and Morse and Munro (2018) explored museums as "spaces of care" and suggested that everyday practices performed by museum staff, material entities and space could be viewed as care. Buse et al. (2018) illuminated laundry, building design and architecture in care homes and connected space and time in a study about laundry "[…] flows, movement, and standards – creating a choreography of laundry." (p. 712). Choreography thus conceptualises the temporalities and spatialisation of laundering and provides an understanding about how doing the laundry could be viewed as a prescribed dance.

The analytical approach in the present paper builds primarily on relational materialism, as proposed by Law and Mol (1995) and Mol (2002), suggesting an analytical focus on how, what, when and why entities are enacted in different care practices and how they are performed in different choreographies. Another layer is the take on power, inspired by topologies of power (Allen, 2016) where power could be fairly silent, but still present and influencing everyday life. A third layer in the analyses is fluid and fire topological space (Mol and Law, 1994; Law and Mol, 2001), to elucidate spatiality, entities and relations made present or absent in laundering power and care.

4. Previous research

Practice theory-inspired research on laundering is prevalent in academic literature on washing and drying of clothes, towels, bed linen and other fabrics found in homes (Shove, 2003; Verbeek; 2006; Strengers, 2009; Browne, 2016; Jack, 2018). Shove (2003) explored "doing the laundry" from the perspective of different individuals and her starting point was the increase in frequency for how many times people washed

clothes and linen. Households in Great Britain and the USA had tripled the number of times they did the laundry since the 1950's. The socio-material practices of today have made doing the laundry more accessible, with washing and drying machines in homes, machines that are relatively quiet, quicker, come in different sizes to fit into different spaces at home, and are more energy and water efficient. At the same time, doing the laundry has become more complex with a general increase in ownership of apparel, of different materials that require different washing temperatures and cycles. Pink et al. (2017) argued that social practice theory has a set and predetermined research approach and might overlook interesting and important empirical data, analysis and understandings of a phenomenon. Pink et al. (2017), guided by for example social anthropology, material cultures studies and phenomenological anthropology, preferred an open-ended research approach focused on temporalities, environments and activities as fundamental elements of everyday life at home. Informants in the research projects were perceived as participants, inventors and improvisers of diverse, different, ambiguous and destabilising laundry practices (Pink, 2005). Pink (2012) suggested laundry and laundering as being elements of "sensory home", where home is partly (re)constituted by how fabrics feel, look, smell and are managed at home – how they are laundered, dried on radiators, ironed, aired and stored in different parts of the home depending on whether they are categorised as clean or dirty, wet or dry, creased or smooth - in a constant "laundry flow" (Pink, 2012, p 70).

Schwartz Cowan (1983), Berner (1998) and Jack (2012, 2017, 2018) have highlighted the relationships between women, homes and cleanliness. Dirt and dust have historically been connected to bacteria that are able to enter the body and develop illness and it became the responsibility of women to look after the family and keep discomfort away from the home by washing and cleaning (Berner, 1998). Technologies like washing machines and vacuum cleaners, in combination with changing norms, have escalated the demand for cleanliness and resulted in more domestic duties for women (Schwartz Cowan, 1983). Laundry, in particular, has been kept as a female domain in Sweden, where women on average spend three times as many hours on taking care of clothes, towels and linen at home than men in Sweden (Jack, 2017).

Several authors in the empirical field of cleanliness at home related their research to sustainability and use of resources such as energy and water (Shove, 2003, Gram-Hanssen, 2008; Strengers, 2009, Jack, 2018) or climate change issues (Mee et al., 2014), and their own critical stance towards how domestic routines, habits, conventions and practices were established within the sustainable development discourse. Embedded in this discourse are also powerful norms and values about how to use modest measures and reformative politics to slowly change the direction of our use of resources. Swedish households are part of these politics and households are often viewed by both local and national governments as a place or platform for sustainable development, where policies are expected to be enacted and create change. Current research not only questions the commercial influences of cleanliness and laundry conventions, but also the politics and measures directed towards individuals and households. Are individuals and households to blame for the current negative environmental and climate situations? Who should feel responsible, and who should take action? (Bradley, 2009).

Communal laundry facilities that are shared in a block of flats or the immediate neighbourhood are not unique to Sweden, but have also been constructed in, for example, Australia (Waitt and Nowroozipour, 2020). Care for these common facilities has been highlighted as an issue, and lack of care evoked emotions of frustration and disgust over "dirty and messy materialities of the communal laundry" (Waitt and Nowroozipour, 2020, p. 14). Washing machines could be perceived as holders and carriers of dirt residues and germs from other people's clothing and bodies. Waitt and Nowroozipour (2020) suggested "doing […] washing in the communal laundry a space of assembling, becoming, differentiating and diverging" (p 14) and in their Australian study not a pleasant experience but rather an activity tenants avoided, if options like washing clothes and linen at home was available. Similarly, communal laundering in Sweden has also contained identity work and the establishment of ties between people in a neighbourhood (Henning and Lövgren, 2002; Henning et al., 2015). But in addition to what tenants experienced in Australia, communal laundering in Sweden was presented as both "an important arena for neighbourly interactions" and "a classic source of conflict" (Henning and Lövgren, 2002, p. 63). In the study by Henning and Lövgren (2002) some tenants pointed at "foreigners" and "immigrants" who are "[…] not used to, they haven't…it takes a bit of time for them […] and we accept that" (p. 136), since the general laundry practices in Sweden include several "do's and don'ts" about when and how laundering should be done (Lund, 2009).

Laundry facilities and rooms were analysed by Waitt and Nowroozipour (2020) as a "political space of engagement" (p. 16) and people engaged in activities related to laundry will have an embodiment of laundering. Embodiments of laundering entail, for example, experience, knowledge, norms and values, and are enacted as people relate to configurations of a laundry room and doing the laundry. Waitt and Nowroozipour (2020) draw on Deleuze and Guattari (1988), Braidotti (2002) and Neimanis (2017) regarding rhizomatic, more-than-human and posthuman encounters with bodies, materialities and emotions. Building on Waitt and Nowroozipour (2020), and their reference to Deleuze and Guattari (1988), a topological view on power and space suggests that "events elsewhere are enfolded or woven into the political fabric of daily life" (Allen, 2016, p. 35). What is included in the political fabric and how the inclusion and exclusion is done should be key concerns for research based in topologies of power and has been a source of inspiration for the present paper.

5. Methodological approach

The research for this paper was guided by approaches suggested by Haraway (1991, 1997) – situated knowledge, and Puig de la Bellacasa (2012) – thinking with care, where phenomena are viewed together with their relations to humans, non-humans, their worlds, and the associated "doings". Both approaches call for academic work that explores phenomena as thick, layered and relational, and acknowledges tensions and frictions. In practice, these approaches mean spending time in the field, exploring and talking to the people involved and asking about their relationships and the challenges they experience. Humans involved in laundering practices in this case are tenants and area managers (employed by the property owner) who perform activities related to laundering in homes or communal facilities. Other actors, who influence the system from a distance, are for example local politicians, owners, designers, technicians and manufacturers. A public housing company, owned by the local government in a Swedish mid-sized town, owns the buildings, apartments and the 500 laundry rooms with their equipment and machines for washing and drying laundry. The empirical work consisted of visits to and observations of five different laundry rooms, interviews with 32 tenants in their homes, four area managers in their offices and a laundry host – a part-time employee, working daytime and assisting tenants in the laundry room. The visits to tenants' homes included a guided tour of the apartment, while the tenant talked about everyday activities at home. The interviews were semi-structured, recorded and transcribed. The transcripts were analysed in relation to questions about how laundering was performed, where and when practices related to laundry happened, and why. The analyses were guided by our interest in details of tenants' reasoning about laundry and laundry activities, about clean and dirty laundry, and about who and what was involved in laundering at home or in communal laundry rooms. In some shared laundry rooms, the public housing company had installed new, energy saving washing and drying equipment as part of a company programme to reduce energy use in the buildings. Directives to reduce energy stem from the company's board of local politicians, who decided this company should aim for a goal to reduce energy use by 25 percent by 2025, starting in the year 2011. The study started with an

interest in how energy saving measures were received by tenants and about their views on being part of these overarching environmental objectives. As data was collected and analysed, different tensions emerged from the material and these tensions backgrounded the focus on energy saving measures. To do the data justice, a critical analysis of care and power relations was chosen as the main contribution in this research.

6. The choreography of laundering as processes of materialisation and spatialisation

Understanding laundering as a matter of care (Mol et al., 2010) calls for an acknowledgement of the labour, maintenance and repair of laundry to "fix" dirty laundry. The fixes come in various spatial and temporal shapes and include many movements of fabrics as they are carried on bodies, placed in beds and around the homes - as bed linen, tea and bath towels, and eventually enacted as dirty. Fabrics could then be brought to the washing and drying machines; equipment that could be placed in the apartment, in the basement laundry room or neighbourhood laundry building. Shaping of phenomena in socio-material approaches is perceived as a mutual process, where not only do people influence the design, configuration and possible uses of machines and technologies, but devices shape and categorise phenomena, for example how washing machines produce categories of dirt (Shove, 2003). The shaping also includes spatialisation activities, where spaces in and around homes are designed, dedicated or refurbished to fit for example a washing machine, and form part of the process of categorising dirt. How often is this space made available for individual households to do their washing; how many washing machines are available during the washing slot; and how are the spaces for drying clothes and linen designed and equipped? Are the apartments designed and equipped for alternative management of clothes that are not categorised as dirty? Is there, for example, equipment to air or dry fabrics on balconies or patios? A topological approach suggests the relations constitute the spatial, which might be fluid or fire space, enabling entities and their relations to constitute spaces for laundering.

In this case, the design of individual apartments varied in the space made available for a washing machine or tumble dryer, thus creating certain practices around laundering available to tenants. Charlotte lived in a three-bedroom flat with her partner and her youngest son. Her two other children lived with their father.

I: How often do you do the laundry?
C: Once a week. Well, we do it in the laundry room.
I: Do you have a washing machine in the apartment too?
C: No
I: Would you like a washing machine in your apartment?
C: No, it is way too small
(Interviewer and Charlotte, tenant)

If circumstances were different, and Charlotte and her partner could rent a flat with a bigger bathroom, a washing machine would be convenient, according to Charlotte. But the washing equipment wasn't her main concern. The combination of the start and finish time of the laundry room slot did not fit with the capacity of the drying equipment. Charlotte used the drying cabinet and claimed time wasn't enough and sometimes they had to carry damp laundry up to the apartment. The remaining drying would have to be done in the apartment. The laundry work was mainly carried out by Charlotte, especially during ice hockey season, when her partner was playing away. Her son had never set foot in the communal laundry room.

Bodies, movement and care in relation to the communal laundry areas have to be carefully choreographed in order to facilitate smooth and frictionless use and transitions between tenants (cf. Law, 2010). People have to start and finish within their time slot to prevent annoyance and disturbances, as described by Waitt and Nowroozipour (2020). The choreography includes tenants moving up and down the stairs of the building, or using the elevator, carrying their dirty laundry, washing powder and fabric conditioner downstairs, and bringing their clean and dry laundry upstairs to their flat. The choreography enables a socio-material and spatial dance (cf. Law and Singleton, 2005; Law, 2010), mutually shaped by tenants, property owner, booking systems, washing machines, dryers and laundry. The dance is fluid, constantly changing in the details, but also maintaining many of the norms, values and practices around laundering.

Berner (1998) described a rise in classifications of housing space and different activities, categorising certain spaces and activities as "backstage" and a domain for women and children. Behind the scenes, housework like laundering could take place, and the power over the ordering of things was mainly in the hands of women. Berner (1998) writes: "This power rested on competence. Keeping things clean and keeping them in order was work. It required knowledge and self-control" (p. 339). Floor plans for multifamily houses designed by architects put laundry rooms in the basement of buildings or in separate buildings. The placement of laundry facilities indicates that the performers of laundering activities are expected to have both time and abilities to move through time–space, up and down stairs, in and out of doors and buildings, carrying bags and baskets of laundry, bottles with chemicals like detergents and fabric conditioners, and keys or tags for access to the locked rooms. One key to the apartment, one key to the basement door, another key to the laundry room and yet another key to the little lock to secure your laundry spot. Laundering in the basement of communal buildings has in some cases not been perceived as safe by the residents and in some recent renovations of housing in Sweden, the laundry rooms in the basements have been moved to ground level (Glad, 2005). In the present case study, the housing company experienced a decline in demand for communal laundry facilities in some neighbourhoods. This was true in one of the less affluent residential areas, where the housing company initiated a discussion about spatial and temporal aspects of the laundering facilities they would provide. Should the laundry buildings be decommissioned or transformed into another laundering concept: monthly laundering facilities? In either case, a change in concept would have to include providing and installing one washing machine and one tumble dryer in each and every one of the 977 apartments. The two machines would be installed as a "tower", commonly known as a "laundry tower", with the tumble dryer sitting on top of the washing machine. The bathrooms are usually dedicated spaces for laundry towers, but before installation the spaces have to be refitted to manage an increase in humidity due to laundering. A laundry tower might also be an option for individual households that for various reasons doesn't want or cannot use the common laundry rooms:

> Well yes, I have a washing machine in my apartment since I have had surgery on my back so many times. And I have not managed to, what is it called, walk to the laundry building, carry and lift. And that is why I have, kind of had, had to. So I rent it through [name of the housing company] […] it is SEK 100 [EUR 9] per month. (Aina, tenant).

Care for tenants' cleanliness and management of their laundry has guided the actions of the property owner, as they let laundry facilities evolve to fit individual needs and changing washing habits among groups of tenants. Regardless of the reason behind changing needs, individual households are offered the option to include a washing machine and sometimes also a household tumble dryer in the rent. Spaces for laundering are in this case characterised by fluidity, with constant changes and different options being considered, options that might be more or less realistic to implement. A tenant's wish for private laundry equipment might be hindered by what sizes of washing machines are offered, household budgets for an increased rent, and space at home to accommodate drying of laundry.

7. Caring for clean laundry through automatic and manual controls

Laundering can be found in many versions, and everyone has their own version of laundering and enacts different entities to carry out laundry practices in time and space. Care for the environment (cf. Eidenskog, 2015) was enacted by the property owner by investing in new washing and drying equipment that would lower energy and water consumption, and limit the detergent and fabric conditioner options for tenants. The dynamic processes of bringing absent entities to the fore and making them present includes, in this case, climate change and environmental issues, which motivated the board of the property owner to set an energy saving objective for the rental housing business. Included in these processes was also the "othering" of certain tenants and what was perceived as their non-environmentally friendly practices (cf. Jack, 2018; Waitt and Nowroozipour, 2020). These practices included, for example, the use of chlorine bleaches which some groups of tenants included in their laundry activities. Another was the running of washing machines and drying equipment on empty, to "clean" them after the previous tenants and pre-heat tumble dryers and drying cabinets to make the drying quicker and more efficient. The laundry host Ingrid had noted some unwanted practices:

> Too much washing powder put in [the washing machines]. Throw in massive amounts of fabric conditioner. I don't like that. […] Foreigners use chlorine a lot, yes. They use a lot of chlorine. (Ingrid, laundry host).

Henning and Lövgren (2002) observed tensions between laundering practices that different neighbours experienced, with some tenants specifically pointing at "foreigners" or "immigrants" as groups of people who had difficulties adopting the generally established practices in communal laundering. Foreigners were "absent made present", and in some sense used as an excuse to implement digitalisation and automation of laundering. New technologies were enacted to make unwanted practices absent. Over time and gradually control over when and how laundering could be done was transferred from tenants to the machines and automatic locks on doors to laundry rooms. Laundry rooms could in these cases be understood as fire spaces, where events in other specific locations influence how space was configured, without being directly connected in time–space.

A tension between an increase in automation and the desire to manually work with and control the laundering space, machines and booking system was noticeable in the interviews with tenants. An intention from the property owner was to take control over the unwanted situations and behaviour, for example "stealing" laundering slots of other neighbours and the use of bleaching liquids like chlorine in the washing machines. Automation was viewed by the property owner as part of the solution to such problems in certain neighbourhoods, noticeably less affluent city districts. One automated feature of washing machines was laundry powder, which was purchased in bulk by the property owner and automatically dispensed in the "right" quantity depending on washing cycles and load. Tenants loaded the machines with laundry, the machine weighed the fabrics and distributed a certain amount of washing powder. Some tenants had doubts about this new order:

> I bring my own washing powder if the laundry is very dirty. My guess is that the laundry powder actually – which is environmentally friendly and very good, but – it [the laundry] doesn't get really clean. If it [the laundry] is really dirty. [laughter] (Caroline, tenant)

A topological understanding of power suggests power could reach into everyday life through, for example, designs and configurations of technologies (Allen, 2016). In this case tenants are gently forced into coping with automated dosage of washing powder, but could still make their own configurations and add some detergents of their own. A "quieter register of power" (Allen, 2016, p 2) is at work here, suggesting certain practices but still leaving other options open. Even if the landlord provided washing machines without compartments for detergents and fabric conditioner, tenants could still add washing powder directly to the laundry.

Laundry rooms are in several ways fluid spaces, where there is a constant tinkering of configuring laundering practices (Mol, 2008). Some configurations were, however, scripted to be more fixed and impossible to adjust by tenants. With the facilities in the present case, washing cycles were relatively short, which made tenant Caroline question how efficient the machines were. Is a washing cycle of 38 min really long enough to get the laundry clean? "[…] Laundering goes quickly – 38 min is quick, I reckon." (Caroline, tenant). There seems to be a tension between tenants' appreciation of short laundry cycles, and finishing the laundry quickly, and an expectation of certain extensions in time for laundry cycles to really make the laundry clean. The semi-industrial design of the laundry room washing machines includes pre-set options, easily available on the front of the machines – just press a button – 40 or 60 degrees – and the washing machine will start immediately, weighing the laundry, displaying the weight – for example 4.5 kg – and the tenant can fill the dedicated, built-in compartments with laundry powder and conditioner. This is perceived as an easy, "plug and play" option, instead of looking for the right washing programme and temperature by turning a knob on the washing machine back and forth.

The laundry routines in the different households were also described as either more "automatic", with similar procedures every or every other week, or more manual habits, where laundering was adjusted according to various demands, depending on activities such as sports.

> It depends [how often I wash clothes]. Typically, I would – like – wear t-shirts under, and such, I typically would use a day, but this [a shirt] I could use a week, as the jeans. Socks and underpants, those are also… And almost all training clothes also only once […] I sweat quite a lot, so typically what is closest to the body, I wash often and kind of the next layer must last a little longer, kind of. (Hans, tenant)

This single tenant used the laundry room often and finds the facility suitable for his laundry habits, with irregular and frequent washing of sportswear and the layer of clothes closest to the body. Often the machines were fully loaded and most laundry was washed at 60 degrees, except for shirts that require ironing after washing and drying, which were washed on a 40 degree cycle. Another tenant, Anton, was a student who lived with his girlfriend and they did their together laundry once a month, or every 3–4 weeks.

> We pile up the laundry in a basket trolley in the bathroom. We wash once a month, or so, I don't know, together, us two. It's not more often than that, actually. Or I don't think so. Or perhaps every three or four weeks. It usually works fine. There are often available slots, so you can go down [to the laundry room] a day or so ahead and book. And they have two big machines down there. And a big tumble dryer and drying room. So it is done in two or three hours. (Anton, tenant)

Shove (2003) suggested that "[t]he size and content of the laundry basket is [..] closely related to the textile and fashion industries and mass production of clothing." (Shove, 2003, p. 118). The designs and scripts of many of the objects and machines involved in laundering have been developed for efficient care of a variety of fabrics and types of dirty laundry. The complexity continues to grow around laundering, as new fabrics and materials enter circulation and require special handling in the washing machines.

8. Care for the environment and social dimensions of laundering

Mol et al. (2010) tried to make us more aware of how care and technology are interlaced and could also include, for example, control and economics. For municipal housing companies governed by a board

of politicians, sustainability objectives might be guiding decisions to invest in new equipment. In this case, investments in new equipment were made as part of the aim to reduce energy use. New washing machines used hot tap water from the district heating system and new tumble dryers used heat pump technology to lower use of electricity. Care for the environment and business economics guided this company to invest in new technology (cf. Eidenskog, 2015), but tenants questioned the functionality and benefits for the environment:

> Don't like the new [tumble dryers]. The laundry doesn't get really dry. It is supposed to be something to do with thinking about the environment, which is not always that good. It doesn't get dry. […] Well they, well it takes a really long time to dry. Especially, I don't know if they [the tumble dryers] are smaller, yes they have to be smaller. So you can't load as much in them. (Anne-Louise, tenant)

The main purpose of the tumble dryer, to get the laundry dry, is missing in the new human-material-machine interaction. The performance failed, both in respect to purpose and capacity. The time–space designed to host laundering practices of tenants did not cater for longer drying cycles and the amount of damp laundry. In this new situation, tenants enacted a reliable and available alternative: the old tumble dryers, still in place and effect in the laundry room. Anne-Louise (tenant) continues:

> Now I'm terrified, these two old, as long as they keep going, I'm very happy. But otherwise, I don't know what I'll do. (Anne-Louise, tenant)

Another alternative was enacted in this new situation – use of the drying cabinet, which was not the preferred option, but would do in order to finish washing and drying within the limited allocated laundering time–space per household. Drying in the cabinet had obvious disadvantages, since it wouldn't get the laundry as soft as in the tumble dryer and it slowed the laundering process down and distorted the preferred drying routines. An advantage would be that drying in a cabinet wore out textiles to a lesser extent than a tumble dryer cycle. Another version, existing simultaneously with Anne-Louise's version and making the new tumble dryer multiple, is the laundry host Ingrid who made attempts to learn about the new machines and communicate with the tenants about the advantages of the new technology and how to operate the new tumble dryer. Ingrid learnt from the manufacturer's representative that the combination of tenants' choice of washing cycle and heat pump powered tumble dryers is probably what is causing tenants' frustration. Short washing cycles have a short spin drier sequence, which is not enough time to get the laundry dry enough for the new tumble dryer. The laundry is too wet when loaded into the tumble dryers. Care for this particular laundry room was manifested by the presence of a laundry host Ingrid. Anne-Louise and other tenants in this building preferred to do their laundry when Ingrid was working, as she was able to provide guidance on how to use the different machines.

Another tenant, Astrid, had lived in the same building and used the same laundry room for 49 years. For her one of the major changes recently is the introduction of "tags" to access the facilities. Tags in this case are radio frequency identification devices that are given to all tenants, have a unique identification and are used instead of keys to open locks on doors to communal and shared spaces such as staircases, recycling rooms and laundry rooms. Astrid appreciated the use of tags, but found the digitalisation of the booking system somewhat difficult to learn. In the earlier years as tenants, bookings of the laundry rooms were made by signing up on a shared calendar, and Astrid had experience of having her name erased or crossed over, and someone else using her time slot instead. The digital system is better in that respect. But to book a laundry slot, Astrid calls laundry host Ingrid, who helps her with the booking. Astrid always does her laundering during Ingrid's working hours:

> We [laundry host Ingrid and I] are like friends, she and I, you know. Drink coffee and like… I have a wonderful time down there [in the laundry room], yes I do. (Astrid, tenant)

The social dimension of Swedish laundry rooms has been acknowledged previously (Henning and Lövgren, 2002; Lund, 2009). The space for laundry can host spontaneous interactions and chats between tenants who would otherwise not meet. Laundering is something all tenants can relate to and many have something to say about the space, the machine or the organisation around the shared space. The digitalisation and use of tags hindered people from entering the laundry rooms, if they had not booked the slot. Another version of digitalisation was securing of the space, and your own laundry from other people. Relations could be built either around individuals, their laundry and household as part of the strong current for individualisation in Swedish society, or relations could be built with others, neighbours and their lives.

9. Conclusions

In this paper, it is suggested that relational materialism as proposed by Law and Mol (1995), Mol (2002) and conceptualised as *care*, would benefit from an explicit focus on spatiality and temporality (Law, 2010; Allen, 2016). To conclude, we return to the aim of the paper: to explore laundry practices in Swedish rental housing and to make a theoretical contribution in the field of care, which could incorporate spatial and temporal aspects to be more inclusive. The current paper has elucidated spatial and temporal dimensions, understood as topological, in addition to the socio-material aspects of laundering, by focusing on dynamics in everyday life and as digitalisation and automation entered care of laundry. The empirical results show how interactions between humans and the social dimension in communal laundering are important but at risk when laundering is individualised and placed in private spaces of homes. A communal laundry room could facilitate care for each other and new friendships, although previous research also acknowledged potential tensions between tenants (cf. Henning and Lövgren, 2002; Lund, 2009). Choreography (cf. Buse et al., 2018) emerged as a key concept that captures timing, movement and use of space for laundering as tenants try to manage their dirty and clean laundry at the right time and place.

Thinking with care as a methodological approach has brought backstage activities associated with laundering and hidden in basement laundry rooms or backyard laundry buildings to the fore. These spaces have proved to be important for tenants to manage their everyday life and quotidian activities of washing and drying home fabrics and clothes. When the theoretical concept care (Mol, 2002, 2013) was included in the analysis, the material and technology unfolded as tightly coupled to the practices of laundering. Mundane technologies like washing machines were loaded with features that influenced whether they were suited for individual or communal use, and for use by a variation of different users. Care for efficiency overshadowed other values, especially time efficiency and use of communal space for laundering. Communal spaces for laundering were designed to provide space and time for efficient washing and drying, and facilitated standardised and normalised laundering activities, but failed to be flexible for individual requirements. The individualisation of laundering would imply releasing communal space but also mean densification of individual flats when machines are installed in bathrooms not designed to cater for such white goods.

Shove (2003) developed "scripting", drawing on Akrich (1992), to include not only how the design and programming of technologies influences our actions, but also how "scripts" shape how we think and create meaning. In the present paper it is proposed to incorporate the design and organisation of indoor space in the notion of scripts. For tenants in Sweden, communal laundry rooms or buildings have historically been part of the provision of housing in a welfare system. New housing does not include communal spaces for doing the laundry, and in

planning for renovation of housing, property owners are considering closing the communal facilities and installing "laundry towers" in refurbished bathrooms. For households which have washing and drying facilities in their home, the choreography of managing laundry is shaped by the social, material, temporal and spatial aspects of the home. For households in multifamily housing with communal laundry rooms or buildings, the choreography is more complex, involving the movement of bodies, clothes, linen, towels, detergents and conditioners in patterns which fit the design of communal laundering areas and temporal management with time slots. The added layer and complexity involved in the Swedish case shows how power relationships co-evolve around laundering and how the notions of time–space and choreography could make the concept "scripting" more inclusive and sensitive to matter that matters.

Care for the environment (Eidenskog, 2015) was one of the top-down incentives to invest in new laundry technologies, such as the heat pump tumble driers in communal laundry facilities. However, this technology did not fit into the existing time–space of individual laundry slots and the choreography of tenants' movement between homes and laundry rooms carrying essential laundry items. A topological understanding of how power works from a distance shows how tenants' laundry practices are influenced by technologies chosen by others, making laundering a more complicated mundane activity for tenants. Environmental arguments for installing new types of tumble driers or providing automatic doses of detergents were overshadowed by the inconvenience experienced by the tenants. Care for the social aspects has historically in Sweden been part of communal laundry practices, with the laundry room being one of few spaces in apartment blocks where tenants do not just pass by, but also actually meet and talk to neighbours, or a laundry host, and weave a social fabric together. With laundering becoming a practice tied to individual flats, social encounters between different tenants can become rarer. As a positive effect, clashes can be avoided, but the social fabric might become thinner.

Declaration of Competing Interest

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

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