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The Comfortable Home and Energy Consumption

ABSTRACT

This paper investigates relations between notions of comfort and notions of home, aiming at a better understanding of residential comfort and the related energy consumption. Residential comfort is examined through a practice-theoretical lens and as something that appears in between the social and material structures of a home. The approach considers different elements of comfort in homemaking practices, such as the body, materials and social meanings. The paper examines how conceptions of comfort and homeliness interrelate through homemaking practices and thereby redefine comfort within a framework of the home and social practices. This implies focus on 'the comfortable home' as made up of homemaking practices that include knowhow, sensations and social norms. The empirical basis comprises interviews and visual data from a field study on detached housing on the outskirts of a Danish city. The paper concludes that the notion of home is central in understanding comfort and energy consumption in dwellings, as conceptions of comfort and home are intertwined but also carry different meanings. The different rooms of a house relate differently to the notions of home and comfort, which has implications for how energy is consumed within the home.

KEYWORDS

Comfort, energy consumption, homemaking, social practices, photo-elicitation

Introduction

Changes in residential energy and heat consumption can be due to changes in the way comfort is perceived and conventions of comfort in the built environment (Strengers 2008; 2011; Shove 2003; Chappells & Shove 2005; Shove et al. 2008). Vannini and Taggart (2013) studied domestic comfort in off-grid homes while taking into account the everyday life and specific socio-spatial context of this type of home. They note that: *"(...) notions of comfort shape how we value our dwellings and relate to them"* (Vannini & Taggart 2013: 1078). Therefore, to scrutinise understandings of domestic comfort, it is also essential to understand the relation between residents and their home. Comfort is central to how dwellings are used, everyday life practiced and, consequently, how energy is consumed in the home. Hence, to approach changes in residential energy consumption, it is necessary to understand what a comfortable home means and what implications this may have for daily energy consumption. This approach includes looking at houses as homes. Much of the research on energy-efficient housing in building science is concerned with the physical structure of the house, such as the efficiency of the technologies that sustain energy and other functions, without much regard to the social practices that turn a house into a home (Ellsworth-Krebs et al., 2015). While considering a 'comfortable house' means

looking at materials and technologies, considering a 'comfortable home' takes into account practices of homemaking and everyday life.

Recent studies in relation to residential energy consumption and sustainable housing have placed focus on the social and sensory aspects of comfort, knowhow, homeliness and resource use. (Pink 2004; Royston 2014; Wallenborn & Wilhite 2014; Hauge 2013; Gabriel & Watson 2013; Goodchild et al. 2014). These studies have broadened ways of understanding energy use in the home. The comfort of a house is dependent on many aspects of the house-as-home. Therefore, this paper investigates how such different aspects of comfort are related to the feeling of homeliness and thereby how homeliness can contribute to qualify the understanding of comfort in relation to dwellings. This is central to understanding how dwellings are made into comfortable homes, and how energy is consumed through homemaking practices such as doing laundry, baking, relaxing, showering, and caring for family members. The aim is to qualify residential comfort through understanding it as part of energy-consuming homemaking practices, including social meanings, bodily sensations and material stuff. Further, the paper discusses how this approach has implications for understanding residential energy consumption related to comfort.

The first section introduces practice-theoretical perspectives related to comfort, with focus on sensations and the body, followed by an introduction to the home as a material, social and sensorial place. After this, there is a presentation of the qualitative methodology of the study and the data. The empirical analysis engages with meanings of comfort and home in homemaking practices, and with how different rooms in a home relate to these meanings. The discussion reflects on these issues and the 'comfortable home', as well as relations between homemaking practices, uses of the home and the implications for consumption of energy.

Social practices of comfort and homemaking

Knowhow and the body in practices of comfort

Practice theory has attracted great interest in the socio-technical research field of energy consumption as an approach that engages with the habitual and mundane practices of the everyday. In this regard, energy consumption is seen as an outcome of these practices (Shove & Walker 2014). Practices are regarded as central to understanding the social world; hence emphasis is on practices such as cooking, cleaning and watching television that are shared across space and time, but performed differently by individuals. Scholars within practice theory and energy consumption studies have established that everyday practices of residents in housing determine to a high degree the energy consumption of a house, or household, as the majority of daily residential routines consume energy (Wilhite et al. 1996; Gronow & Warde 2001; Gram-Hanssen 2010; Strengers 2011; Butler et al. 2014). Practice theoretical scholars have further researched thermal comfort, for example practices of heating and cooling, as these are highly

energy-consuming practices related to residential comfort (Strengers 2008; 2011; Shove 2003; Gram-Hanssen 2010 2011; Hitchings 2011; Jalas & Rinkinen 2013).

Day and Hitchings studied comfort within the domestic setting of homes for the elderly and their practices of keeping warm in winter, that is practices that are related to the body and the home (Day & Hitchings 2011: 887). These practices are viewed as embodied, thermal sensory experiences, and as cultural phenomena relating to social activities, privacy and identity. The practices of keeping warm included warm clothing, and items such as blankets and hot water bottles. The practices were discussed as reflecting style and self-presentation, the spatial order of the home, public-private domains as well as ventilating the home, even in cold winters to let in fresh air, to keep mentally alert, and to avoid odours (Day & Hitchings 2011). Also in the domestic setting, Vannini and Taggart characterise comfort to be *"a quality attributed to sensations, emotions, and objects"* (Vannini & Taggart 2011: 1079) and following Bissel, they define comfort to be an affective complex of bodily capacities and feelings. This bodily capacity is combined with socio-cultural notions of comfort.

Simonsen has stated that everyday practices are intrinsically corporeal (Simonsen 2007: 171). Social practices are further described as routinized and embodied (e.g. Reckwitz 2002) and the study of practices related to comfort implicates the body as playing a significant role. Knowhow related to, for example, heating practices, such as using a thermostat and determining hot and cold, is incorporated in the body as embodied habits (Gram-Hanssen 2010; Gram-Hanssen 2011; Royston 2014). Wallenborn and Wilhite (2014) further establish the importance of the body in energy consumption and practice theory, by criticising the focus on rational and individual behaviour in energy consumption literature. They instead state that the escalating energy consumption can be interpreted as a 'transformation of bodies', through practices. In other words, changes in what we perceive as comfort and how we practice our daily lives are inherently bodily (Wallenborn & Wilhite 2014). Thereby, bodies are shaped by practices just as bodies perform and sustain practices. Consequently, comfort is sensed and perceived both bodily and mentally and can be understood as embodied knowhow, bodily sensations and social meanings, for example of home.

Home as place and practice

A home is situated in time and space and can be understood as a place, as noted by Easthope: *"home is, first and foremost, a special kind of place"* (2004: 135). In line with this, Doreen Massey's (1995) conception of place as a social production can form the basis for understanding home as a place. In this approach, the meaning of place is to be found in social relations that constitute 'sense of place'. Furthermore, place is seen as a process constructed through relations between human beings and the physical environment enacted across space and time (Massey 1995). The boundaries of place are not fixed, but changing and permeable, and this also applies to the concept of home (Massey 1995; Mallett 2004; Easthope 2004). From the practice-theoretical perspective, Schatzki (2002) considers practices as situated in space and place through his

concept of the 'site ontology'. This is a broad framework where practices and material as well as immaterial entities relate to each other in arrangements or orders. These orders comprise immaterial and material aspects of the social and are interwoven with practices. They are not stable, but unfold according to sites in time and space (Schatzki 2002, Everts et al., 2011). This applies a dynamic conception of space and place, where places can only exist through practices arranging the surrounding entities, as well as practices occurring within these arrangements.

Following Blunt and Dowling (2006), home is essentially a spatial conception, that is, both a physical structure in which we live, and a social idea imbued with feelings or meanings. These ideas are spatial and contextual, imbued with cultural, social and historical meanings and thereby they construct and connect homes (Blunt & Dowling). Often, conceptions of home have favoured the physical structure of the house, and 'house' and 'home' have been conflated, resulting in a one-dimensional representation of the home (Mallet 2004). However, a home does not simply exist. It is formed by homemaking practices; processes of both material and imaginative elements that turn a house into a home (Blunt and Dowling 2006). Therefore, home cannot be equated with the physical house or the socio-economic household, as these concepts do not capture the socio-spatial relations constituting home. Rather, home is a socio-spatial system and a multi-dimensional concept; an entity constructed through homemaking processes relating the social and the physical (Mallet 2004; Blunt & Dowling 2006). People create a home through material processes of constructing and building as well as using, placing and replacing objects. At the same time, people create a home through social and emotional relations (Blunt & Dowling 2006; Mallet 2004).

Sensorial practices of homemaking

Research on social practices, comfort and energy consumption has contributed with highly relevant knowledge on how social and material structures are entwined in daily energy consumption in households, and it has criticised the focus on merely technologies and individual behaviour change. In the research on residential comfort and energy consumption, however, the notion of home has not been predominant. Therefore, in contributing to this research, the paper engages with sensorial and social aspects of practices related to comfort and the home, which might concern practices such as heating but also an array of other energy-consuming homemaking practices. As described by Pink and Mackley (2014), energy in dwellings can be seen as consumed "*as part of the process of the ongoingness of the everyday constitution and perception of home as sensory environment*" (Pink & Mackley 2014: 2). Pink has conceptualised the 'sensory home' as a way of understanding domestic contexts as intersections of materials and humans, together with discourses of moralities, identities and the sensory, social and material production of a home, through residential everyday activities (Pink 2012: 52). Along this line, the present paper seeks to explore comfort as part of homemaking practices and the energy consuming daily activities that constitute everyday life and home. This implies looking at homemaking and daily life as social practices situated in a homely space with a specific set of

material possibilities and boundaries, or as relations between social life and material entities. A home is a site of social practices, and the material culture of home is not only understood as the physical structure of a house with its technologies, but all the 'stuff' outside and inside of the house that plays a part in giving meaning to the house as a home (Miller 2001). Thus, the house-as-home is seen as a space where homemaking practices are situated and performed and comfort is sensed and perceived.

Presentation of case and methods

The study used qualitative methods as part of an interpretative research methodology, focusing on the life-worlds of the research participants (Kvale 1994; McDowell 2010). A field study was carried out using interviews and photo-elicitation to supply an in-depth understanding of perceptions and practices of the residents, as well as the relationship between the residents and their surroundings in the specific setting of their home (McDowell 2010). The empirical study included visiting the participants in their homes, carrying out in-depth interviews, home tours, taking photographs and a photo-elicitation study. The study was carried out in detached housing on the outskirts of the Danish city of Aarhus, during the heating season. The choice of detached housing influenced the study in different ways: first of all, the participants were quite socioeconomically advantaged as they were house-owners. This position also reflects a possibility of choice in housing and a specific relation to the home, as house-owners might be more attached to their home and engaged in it. For example house-owners might be more attached to their home and thereby more interested in maintenance of their house and in decorating and retrofitting it to suit their specific needs and identity than tenants are (see for instance Gram-Hanssen and Bech-Danielsen 2004; Aune 2007; Maller, Horne, and Dalton 2012). The first round of the study included fourteen interviews featuring home tours, and the second round was a photo-elicitation study (inspired by Blinn & Harrist, in Rose 2007), comprising three participants. The photo-elicitation data are used in this paper and the study encompassed participants taking photographs, followed by interviews discussing the printed photos. This process helped the participants in reflecting on aspects of their everyday life to which they did not usually give a great deal of thought. However, this reflection had already begun with the interviews in the first round, in which these participants had already participated. At the same time, the photos document the material structure or 'feel' of the dwelling places (Rose 2007). The study was carried out from December 2014 to January 2015. The three participants were asked to photograph what they experienced as, and related to, respectively feeling comfortable [*tilpas*] and at home [*hjemme*] in their dwellings (things, people, situations etc.) as well as where in the dwelling they felt respectively most comfortable and most at home, over three different days. Two of the participants decided they would not include their families in the photographs for reasons of privacy and in order to avoid exposing their children. The interviews were

transcribed and, for the purpose of this paper, interview quotes have been translated from the original Danish into English.

The three men, who consented and completed the photo task all had a higher education, jobs in the private sector and were living with their families in newer detached houses. This could say something about the type of person who agrees to take part in a study like this, involving some technical skills and portraying the private domain of the home. Moreover, it might give a gender-specific version of the meanings of comfort and homeliness in the analysis, as women, for example, might have other favourite spots in the house or other reasons for photographing the kitchen, living room etc. Therefore, the analysis presents examples of how a middle-class Danish male perceives and expresses a version of homely comfort. For the purpose of this paper, the three photo-elicitation cases serve as exemplifying cases of how comfort and homeliness can be perceived. These examples represent a 'thick' in-depth description consisting of narratives that approach the complexity of social phenomena (Flyvbjerg 2006), such as comfort and homeliness, in the specific context of the middle class and detached houses in Denmark. As such, the three accounts presented cannot necessarily be generalised, although when relating these to the study as a whole, they do represent a broader qualitative account of how comfort and homeliness are experienced.

The three participants are: Claus, who is in his 40s and lives with his wife and two nearly grown-up children in a house from 1997. Kasper, who is in his 30s and lives with his wife and two young children in a low-energy house, built in 2012. Jacob, who is in his 40s and lives with his wife and four children (aged four to ten) in a low-energy house, built in 2013. When they bought the house, Jacob and his wife were specifically interested in low energy consumption, and the house was built to a stricter low-energy standard than was usually applied at the time. The three houses were all built quite recently compared to the general housing stock in Denmark, and two are low-energy houses. All three participants had their house built for them and were, more or less, involved in the design process together with the architects. This is not uncommon with newly built houses in Denmark; however, the three participants can be regarded as a special case, as they were all involved in making decisions on the layout, energy technologies and more, which is not common for the majority of Danes living in older houses. Therefore, to some extent the participants had also already reflected on the issues of comfort and creating a home.

Homemaking practices and perceptions of comfort and homeliness

"I think in itself it is a comfort to have a house to come home to" (Camilla, 30s). This quote from the field study shows how perceptions of comfort and the home are closely entwined. The analysis engages with these meanings of home and comfort according to the participants and, subsequently, follows a route around the different rooms in the houses as presented in the participants' photographs. The analysis therefore further engages with uses of the home and how different rooms carry different meanings in relation to comfort and homeliness.

Meanings of comfort and home

This first section deals with ideas, perceptions and sensations of home and comfort as represented in photos and discussions with the three participants.



Fig. 1 Kasper
Living room and
kitchen-dining area

The photos in Fig. 1 show where Kasper felt most comfortable and most at home; in the living room and the kitchen-dining area. The feelings of comfort and home are entwined; when and where he feels most *at home* is also when and where he feels most *comfortable*. In one photo, he was alone reading in the armchair in the living room, the other three show situations with his family¹. Discussing the pictures, he explained that it is both about the specific location in the house, the room, about the soft and comfortable furniture, the coffee, Christmas cookies and candles, and about the practices such as reading by himself or relaxing in the company of his family. As such, his feelings of comfort and homeliness are both attached to the material structure of the room and furniture, the bodily sensations, and to the practices such as relaxing or doing social things like watching a film with his wife, watching TV on a weekend morning with his children tucked under the duvet, or having the extended family over for a Christmas gathering. Describing one of the pictures from the living room, Kasper explained:

“It’s the couch, obviously, where you sit comfortably and softly, relaxing, being entertained, we have candles on the table, and coffee in the coffee pot and cookies

¹ The family is not present in the photographs; however, they were present when Kasper photographed the rooms. He decided that he did not want to have his family present in the pictures.

(...) we like, especially on the weekends, to sit and watch a movie or something (...) I sit together with my wife and watch a bit of television after the children have gone to bed."

The photos and the quote together show homemaking practices that contribute to Kasper's feelings and understanding of comfort and homeliness as being closely related; relaxing, reading, watching television, drinking coffee, eating cookies, having a Christmas gathering. Performing these practices, Kasper feels equally comfortable and at home in the dwelling. Kasper further explained, referring to the photo in Fig. 2:

"I thought it was very difficult to see the difference between feeling comfortable and feeling at home (...) because it is somewhat the same thing, so I thought about what is really the difference between feeling comfortable and feeling at home (...) this, a picture of all the clothes scattered about [in the utility room], the clean clothes that need folding, that is where you feel at home, but not necessarily comfortable (...) it is not so much fun standing and folding clothes, but you are very much at home, when you do it."



Fig. 2
Kasper
Utility room

Kasper talked about doing laundry and explains that, while he does not necessarily enjoy such domestic duties and perceive them as comfortable, they do underline the meaning of home to him. When discussing the two concepts, Kasper explains that comfort is more related to relaxation and leisure time, whereas homeliness can be both about relaxing and doing things with the family, but also about daily chores, and therefore more about the constitution of the family and their home. Claus agrees that it is difficult to separate feelings of comfort and homeliness. He said:

"I feel, to feel at home you also have to feel comfortable (...) I'm happy to come home, it's a place, well, it can be cosy, but it's also a place where you feel safe, there are no unpleasant surprises (...) you know what you come home to, and, it's also something to do with habit."

To Claus, a home is where you feel comfortable, which underlines how notions of comfort and home are entwined. The quote is also about what these notions mean in terms of a space, physically and socially; it is where you feel safe, it is your own domain in the sense that you control what happens. Such ideas have also been central to theorising upon the concept of home, underlining the home as a 'haven' and a sharp distinction between the private and public

spheres (e.g. Blunt & Dowling, 2006). In our discussion of the photographs, when asked, Claus did, however, distinguish between where and when he feels most comfortable and where and when he feels most at home, as illustrated in the pictures below (fig.3):



Fig. 3 Claus
Kitchen-dining
area and living
room

Claus feels most at home when having dinner in the evening with his family in their kitchen-dining area. This is the social gathering place of the family; he explained that it is the one time during the day when they all sit down together to have dinner and talk. The other picture is what Claus explained as the most comfortable; it is also socialising with the family but, at the same time, it has much to do with relaxing and sitting comfortably on the couch, he told me. Like Kasper, Claus also explained that, to him, feeling very comfortable is to be relaxing in the living room, without any everyday chores to do, just enjoying the company of the family, reading a book or using the iPad.

This shows a clear distinction between two main rooms in a modern Danish detached house; the living room and the kitchen-dining area, the furniture in these rooms, and the practices acted out there. To Claus, dining with his family is part of the daily practices that make him feel much at home. The way the kitchen-dining area is furnished makes it less comfortable to Claus, however, compared with the living room with its large couch. Even though dining is one of his favourite activities of the day, essentially representing homeliness, it also has to do with the daily chores of cooking, doing the dishes and so on that, to Claus, are not related to comfort. Therefore, the dinner in the kitchen-dining area represents homeliness, whereas relaxing on the couch represents comfort. The third participant, Jacob, looks at comfort and homeliness as somewhat separate ideas:

“To be at home and the thing about comfort are not necessarily super-connected... I would say, comfort, I think of as being climate stuff, temperature-related stuff, and it does not have to be because it is regulated, all the technology behind it, it can just as well be in a thoroughly thought out house, in relation to the sun, light and wind(...) even of much older date.”

Jacob photographed what, to him, symbolises and demonstrates important aspects of indoor comfort: a thermostat showing the temperature in the house, the air duct of the ventilation

system, a skylight, and the balcony with an overhang that ensures a good balance between sunlight and shadow in the house (examples in Fig. 4). These photos represent a perception of comfort tied to the material structures and the technologies of a house, maintaining a comfortable indoor climate and temperature according to Jacob and his family and, as such, relates well to a more technical understanding of comfort. At stake here though, are also various sensory, bodily, perceptions of an adequate indoor climate and the importance of this to feeling at home.



Fig. 4 Jacob
Overhang and thermostat

In this section, perspectives on comfort and homeliness dealt with the material and social aspects of homemaking practices. Perceptions of homeliness tended to involve more of a social and symbolic aspect, but also the daily routines that occur and sustain the everyday life of a family, such as practices of dining and doing the laundry. These practices underline the social meaning of home. Perceptions of comfort tend to be more related to materiality, but also entail the social aspect of homemaking in being together with the family, such as watching television, reading and relaxing. Feeling comfortable is more related to leisure time for the three men, whereas feeling at home has much to do with sustaining daily family life. To expand these notions of comfort and homeliness, the next section looks into each of the photographed rooms and examines how these carry meanings of comfort and homeliness in different ways.

Places to feel comfortable and places to feel at home

The first section of the analysis indicated differences between the rooms in a house with regard to how they relate to the various perceptions of comfort and homeliness, as well as how they are used. All of the participants photographed their living room, the kitchen-dining area and their home office. In addition, some of the participants photographed their bedrooms, the bathroom, the kitchen and a workshop. Thus, most rooms of a standard Danish detached house are represented, excluding the children's rooms. However, the rooms were emphasised differently and there were different reasons for photographing them.

The living room: relaxing alone and with family

The living room was one of the first choices to photograph for the participants and it relates to both comfort and homeliness. For Kasper, it is where he feels equally both comfortable and most at home, relaxing by sitting in an armchair reading, in the evening on the couch with his wife watching a movie when the children are tucked in, or on an early weekend morning watching TV with the children (Fig.1). He claimed that the central aspect of this room is that it is for relaxation, on your own or with the family, sitting comfortably and softly, maybe with a duvet for

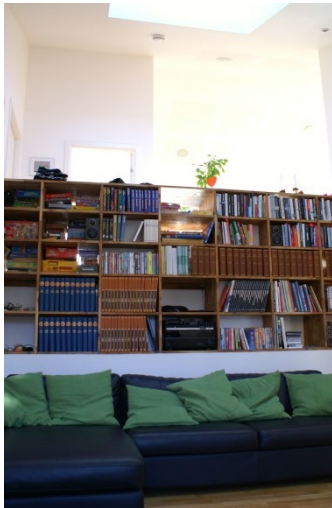


Fig. 5 Jacob
Living room

even more cosiness. Similarly, Claus said that he feels most comfortable in the living room sitting on the couch (Fig. 3), because this room is purely for relaxation when at home. To him, the living room is not related to daily chores; it is just for being together with the family or reading a book. He explained that this is very much the core of being at home as well, because you only do this in your home. Jacob also explained his picture of the couch (Fig. 5) to be where he feels equally comfortable and at home. The picture reflects relaxing practices such as watching television with his wife in the evening, when the children are in bed, providing a calm place and time in the house. Moreover, he explained that the picture also shows a bookcase that he made himself from the floorboards of their former house, and therefore

the bookcase symbolises nostalgia related to that house. Furthermore, he stated that books are important to him in a home, because they tell something about him, just as books in other homes tell something about the people he visits. This reflection ties homemaking closely to identity perspectives as also described in the literature on home (e. g. Mallett 2004).

The home office and the workshop: a private domain



Fig. 6 Jacob, Kasper &
Claus

All three participants photographed their office (Fig. 6), which they perceived as a comfortable and quiet space. Kasper noted:

"I think it's really pleasant to sit in the office, to have that room and environment to work in, you sit comfortably in our office chair and at the table, and there's complete silence from all surroundings, compared to when you're at work... so it's just nice to be able to sit at home and work, you're more relaxed when you work from home, and actually also produce more because it's quiet."

Kasper relates the home office to feeling comfortable, as it is a quiet working space with comfortable furniture. All three participants liked working from home in their office, which signifies some changes to the idea of the home as a 'haven' or a space for rest (e. g. Mallett 2004) enabled by ways of carrying out knowledge-work in contemporary society. Claus said he feels much at home in his home office, because he

sees it as his 'cave'; it is his domain, where he likes to sit, both when he is working from home, and in his spare time, for instance, working with photographs. Jacob similarly explained that the office is one of the places in the house where he feels most at home, because it is a space in which he is surrounded by all the things he needs. He is in charge in his home office. He is also in charge



Fig. 7a Jacob Workshop

of all the clutter in there, which does not bother him, because it is his own. At the same time, it is a space where he feels very comfortable working from home, because it is quiet. Jacob expressed the same feeling of homeliness, of belonging, about the workshop (Figs. 7a and 7b), which is separate from the house, but still, to Jacob, an important part of it: *"(...) it's not really home if you don't have a place for this [repairing bicycles etc.]"*. He explained that this room is also about 'ordered clutter', as the room might appear cluttered to outsiders, but to him there is perfect order, because he knows where everything is. The two rooms are his domains and therefore he feels at home there. At the same time, the workshop is where he produces and repairs objects (e.g. the bookcase, bicycles and



Fig. 7b Jacob Workshop

children's toys) that are significant in terms of making the house homely. Furthermore, Jacob also photographed pegs hanging in the house that he produced in the workshop, thus, to him, making the house more homely.

The bathroom: privacy and warmth

Two participants photographed their bathroom (Fig. 8), which is associated with feeling comfortable, but not necessarily at home. Kasper said:

“(...) it’s a place where you feel comfortable, but maybe not necessarily so much at home, it might as well be any other place, where you stand under the shower and get thoroughly warm... so, I do also feel at home, but it’s more about you just relax there and feel good in the warm shower.”

Kasper further explained that the bathroom is also where he can have a modicum of privacy and calmness for a short while, being the father of two young children. Jacob emphasised the same aspect about privacy in the bathroom. Further, he explained that here you could feel that you ‘lose’ some comfort in a low-energy house, compared with an older 1960s house. The new house is thoroughly insulated, which,



Fig. 8 Jacob & Kasper Bathroom

he said, provides a high degree of comfort in the house in general, and therefore you cannot have a heated floor in the bathroom as it would be overheated. The heated floor was what he associated with comfort in the old house, where only the bathroom had floor heating, and even though the whole house has floor heating now, the floor feels cold because it is heated equally with the rest of the house, he explained. Therefore, they now wear slippers around the house for comfort.

The bedroom: homely and comfortable



Fig. 9 Jacob Bedroom

The bedroom is associated both with feeling comfortable and feeling at home. As an example, Jacob said that when you are sick, the only place you want to be is in your own bed, and therefore to him the bed and the bedroom is one of the most homely spots in the house (Fig. 9). He further explained that it is not just about the bed, the familiar sounds and smells of the home also make it a homely place. Therefore, he felt that if you moved that same bed to another place, for instance a hotel room, you would not feel the same tranquillity as being at home. This has much to do with the security of a familiar space and knowing that this is your place to stay. Kasper told me that his picture of the bedroom represented a place where he feels comfortable, lying in the bed under the duvet, relaxing, for example

by reading before going to sleep. Consequently, Kasper primarily related the bed and the bedroom to comfort, feeling warm and relaxed in a soft spot, whereas Jacob found that the bed is really an image of the most homely place he can think of.

The kitchen-dining area and the kitchen: homely smells and daily routines

The participants associated the kitchen-dining area with both comfort and homeliness. Jacob photographed the kitchen-dining area to show the inflow of light (Fig. 10), as well as the view from the windows, which was important to his feeling of comfort. Claus and Kasper rather related the kitchen-dining area to homeliness, as a place where family life was acted out. Kasper said that the kitchen-dining area was one of the most homely rooms in the house (Fig. 1), because this is one of the places where the family gathers and does things together, such as drawing, playing board games or making Christmas decorations. Kasper did not photograph the kitchen, but he said it also relates to the feeling of homeliness, either by way of the daily practices of cooking, which he does not find enjoyable as such, or by infrequent baking, for example Christmas cookies with the children, which he finds very homely.



Fig. 10 Jacob
Kitchen-dining area

Claus explained how he had realised that the central spine in the house was the kitchen-dining area and the living room; this is where he (and his wife) spends most of the time. He was the only participant who photographed the kitchen (Fig. 11), which shows his son baking Christmas cookies:

“C: (...) I like to cook, and actually we all do...so therefore we also spend some amount of time in the kitchen, and it’s both something we do together and one person cooking for the rest of the family, and it can be the evening meal and it can be breakfast and it can be someone baking something, or other things (...) I: So it’s a kind of meeting place? C: it’s a meeting place, yes.”



Fig. 11 Claus
Kitchen

To him, the kitchen is a meeting place, and a space in the house where, in some ways, you spend a lot of time, cooking meals, cooking tea or just getting something to use in another room, but on the other hand, it is not where he spends longer unbroken periods. Even when cooking, he said, he spends half an hour there and then travels back and forth many times. The family eat in the

adjacent kitchen-dining area, where they spend a longer period dining and talking, he explained. Nonetheless, the kitchen is a room where he feels comfortable, especially because he likes cooking and coming home from work and smelling that someone is cooking dinner.

Claus' and Kasper's photographs were taken around Christmas time, and they showed situations which they particularly related to homeliness, such as Christmas gatherings with the extended family and baking cookies. Christmas cookies were also part of everyday practices, such as watching television, and Claus photographed a decoration with Christmas elves that he thought represented homeliness at this time of year. As such, Christmas time added some meaning to the idea of homeliness in this study, just as the winter season might have increased the focus on warmth and light as aspects of comfort for all of the participants.

Discussion

The perceptions of comfort and homeliness were expressed as bodily sensations and social meanings such as warm and cold, well-being and ideas of cosiness. Comfort was experienced as warmth, soft furniture, relaxation, privacy and also social relations to family. This reflects energy-consuming homemaking practices such as heating, watching television, drinking tea or coffee, showering, and also working from home. The rooms related to this feeling of comfort are the living room, the bedroom, the home office and the bathroom. Homeliness is primarily experienced as the social life of the family, including daily chores of sustaining home and family life as well as things that symbolise this (paintings, books etc.), but homeliness is also experienced as privacy, safety, control and relaxation. This reflects energy consumption in homemaking practices such as cooking, doing laundry, decorating and spending time with the family, for example talking, dining and playing. The rooms associated with homeliness are the kitchen-dining area, the living room, the bedroom and the office.

The rooms mostly related to comfort are the rooms in which the residents relax, together or separately; rooms where there is soft furniture, warmth and serenity. Rooms that are related to homeliness also signify warmth, cosiness and family time; however, some rooms are more functional, where daily chores are carried out. These rooms might have lower requirements, for example, for heating, because they are used for activities rather than relaxing. The kitchen is heated differently, for instance by cooking, and the utility room is not a room in which longer time periods are spent, but one for doing the laundry or other practical activities. Warmth is more important to the residents when relaxing than when actively doing everyday chores or sleeping under the duvet. This shows that the rooms of a house carry different meanings in terms of comfort and homeliness, which reflect the practices acted out in the rooms, and furthermore how energy is consumed differently within these rooms according to the practices. Therefore, the comfortable home is not necessarily one that is heated equally with the same temperature in all rooms, but rather one that accommodates different homemaking practices in different rooms with different energy requirements.

Through this study, perceptions of comfort and homeliness were expressed in relation to the structures of a Danish detached house; the use and meanings of different rooms and the daily life lived there. The detached house caters for personal preferences and privacy. It accommodates one-family living and the possibility of forming a house to accommodate the specific needs of a family. The layout accommodates practices to be carried out in one-family settings; hence everyday practices are carried out privately rather than communally. These qualities of the detached house are also closely aligned with an understanding of the home as private space and signifying identity (e. g. Mallett 2004). Furthermore, single-family housing constitutes the largest part of the Danish housing stock. Therefore it is necessary to understand the energy-consuming practices related to comfort in this type of housing, as these are entangled in both notions of the ideal family home and individual perceptions of comfort.

The versions of comfort in the homemaking practices presented here highlight how energy is consumed in the detached home, which should be taken into account in designing and retrofitting houses-as-homes. These homemaking practices include heating the house to be comfortably warm, preferably without feeling draughts or cold floors, especially when relaxing, reading, watching television and so on. Warmth is a central comfort parameter in Scandinavian housing, but comfortable temperatures are also subject to change with the development in technologies and socio-cultural notions of comfort (Elizabeth Shove 2003; Elizabeth Shove et al. 2008; Yolande Strengers 2008, 2013; Wilhite et al. 1996). The common building and retrofitting of houses is primarily concerned with widely standardised versions of comfort related to the indoor climate and physical structure of a house (Ellsworth-Krebs et al. 2015). However, this empirical study showed how the comfortable home is just as much influenced by ideas of homeliness. Homemaking practices reflect this everyday creation and sustenance of the home, comfort and family life. Some of these practices are less energy-consuming, but just as important for feeling comfortable as practices such as heating. For example, homemaking practices related to comfort also comprise lighting with lamps that create cosy indoor atmospheres, as also shown by Bille (2015). Accordingly, warmth and light are central aspects in this Danish version of the comfortable home in wintertime, similar to what Wilhite et al. (1996) noted on Norwegian homes. Homemaking practices related to comfort furthermore consist of decorating with objects that have a homely feel because they are familiar or related to the identity of the residents, such as books and homemade items. Decorating also includes choosing furniture that is comfortable and suitable for the way daily life is performed in the home, together with the layout of the house. These practices consume energy, such as heat and electricity, in different ways while entangled in bodily sensations and social expectations for the comfortable home. Some homemaking practices require light or silence, and some practices require privacy or company to feel comfortable. This means that the comfortable home includes many parameters and taking account of a broader spectrum could point to ways of designing comfortable homes that are not necessarily highly energy consuming in terms of thermal comfort standards, but rather accommodate a more holistic view of sustainable everyday life in housing.

Following this line, Vlasova and Gram-Hanssen (2014) also pointed to the importance of energy retrofitting to accommodate sustainable everyday practices, if the inhabitants are to be successful in reducing energy consumption. These reflections are similar to the findings of Maller et al. (2012) when scrutinising green renovations in Australian homes. Maller and colleagues found that green renovations were ineffective in reducing households' energy consumption, precisely because these often conflicted with everyday practices and notions of the ideal home. This resulted in, for example, increased floor space, kitchen extensions and added bathrooms (Maller et al. 2012). In this way, the construction of comfortable homes that are also energy-efficient needs to account for everyday practices, bodily sensations of comfort and socio-cultural notions of home. In Denmark, a growing low-energy housing stock and energy-efficient refurbishments have succeed in lowering heat consumption per square meter, however, at the same time the overall amount of square meters have risen (Danish Energy Agency 2013; Gram-Hanssen 2013). These perspectives mirror how *"(...) mainstream ideas of domestic comfort are so deeply imbricated with consumer ideologies"* (Vannini & Taggart 2013: 1078). The notion of domestic comfort in Western homes is closely combined with intensive resource use of the everyday life as well as housing and living standards (Jensen & Gram-Hanssen 2008; Maller et al. 2012; Hagbert 2016). As has been noted by socio-technical scholars (Gram-Hanssen 2010, 2014; Maller et al. 2012; Shove 2010, Strengers 2013), the strong focus on individual behaviour change within energy research and campaigns does not sufficiently address such shared, highly energy-consuming, homemaking practices. Standard definitions of comfort in the built environment rely on physical conceptions of indoor climate connected to the physical structures of housing such as heating technologies, ventilation and windows. However, this study showed that comfort is also connected to different practices of homemaking that are influenced by social ideas of the home.

Conclusions

Research on comfort and energy regarding the house as a physical structure often addresses people as either passive or active users of buildings and technologies, as also noted by Ellsworth-Krebs et al. (2015). This study, instead, regarded people as everyday practitioners performing homemaking practices that involve materials, social meanings, knowhow and bodily sensations. The study showed how the notion of home was important in perceptions of comfort, recognising that this entails social meanings as well as material structures. Feeling comfortable in a house was intimately related to feeling at home. The perceptions of comfort and homeliness were both entwined in the participants' homemaking practices, but at the same time, there were distinctions between the two. Comfort was related more to materiality and experiences of bodily sensations as well as to relaxation and leisure time, whereas homeliness was related more to both social aspects of family life and the daily chores that sustain domestic life. At the same time,

the homemaking practices were just as much about sustaining daily family life as creating comfort in the home. This relationship between the two concepts showed that both notions of comfort and notions of home have implications for residential energy consumption. Thus, the concepts of home and homeliness have an important role to play when dealing with residential comfort. This way of looking at comfort and homeliness contributes to reframing the concept of comfort for the built environment in terms of connecting the knowhow, social meanings and material surroundings that constitute a home through homemaking practices.

The interrelation of comfort and homeliness implicates different uses of the rooms in a house, including the consumption of energy. Researching comfort as part of homemaking practices, makes residential comfort dependent on embodied habits, social relations and bodily sensations, rather than solely on how residents as energy 'users' perceive and adjust temperature and indoor climate, for example. Living in a house is not solely a question of being a user of a material structure including technologies, but rather a matter of creating and sustaining a home. An important issue is that the rooms of a house are connected to different everyday practices requiring different energy uses, for example different levels of heating. However, building regulations assume houses to be heated evenly, and newer technologies often also encourage this development; for example newer houses in Denmark are often heated by underfloor heating that cannot easily be regulated to different temperatures in different rooms. When designing houses, this flexibility of use could be reflected in a varied way of using energy such as heating and electricity, which could more closely follow the practices of the inhabitants, for example in zoned heating or focusing on other aspects of comfort. This could point to an alternative approach to reducing residential energy consumption, as there are many aspects to constitute a comfortable home, aside from temperature. Vannini and Taggart (2015) also pointed to alternative perceptions of comfort, for example in relation to temperatures, light, privacy and convenience, and this shows that a broad spectrum of perceptions of comfort in homes exist.

Energy is consumed in houses to create comfortable homes for the residents in their everyday lives. Accordingly, residential comfort and energy consumption must be understood in terms of the house-as-home. This perspective implies a shift in focus from 'comfortable houses' to 'comfortable homes'. That is, as shown here, taking into account daily homemaking practices including embodied habits and social meanings of comfort. This is relevant in terms of understanding the relation between comfort and residential energy consumption, because it looks into what people do and why, as well as recognising the social aspect of daily life at home. This entails recognising that houses do not exist only as material structures but, at the same time, are homely or unhomely homes, in which the comfort of the residents might depend on physical, material, mental and social aspects connected to the idea of home. As such, comfort, in light of homemaking practices, is a concept that cannot solely be defined in terms of technologies sustaining houses with, for instance, heating. To understand residential comfort and to obtain housing for sustainable living with reduced energy consumption, it is necessary to look at the comfortable home, as this approach deals with the social practices that consume energy in dwellings.

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