Domesticating the "Smarter Than You" Home

Gendered Agency Scripts Embedded in Smart Home Discourses

Deborah Chambers

Smart home networked systems promise a mode of comfort, efficiency and convenience that infers the easing of housekeeping chores. They impact on the moral economy of the home in ways we barely understand. Drawing on feminist technology studies and domestication theory, this article investigates how gendered relations are assigned and legitimated in smart home marketing reports and advertisements to enquire whether men and women are invited to participate equally or unequally in smart home technology. This raises questions about how promotional texts might influence and circumscribe domestic adoption. An interpretive content analysis of marketing reports and advertisements explains the pedagogic role of smart scenarios in coaxing and coaching householders to domesticate IoT-operated technology. The concept of "agency script" is employed to explain how smart actions are conveyed and assigned by promotional texts to activate smart home adoption. This enables an enquiry into the values and ideals conveyed in smart home discourses at the commodification stage of domestication and their implications for later stages. We might assume that smart technology democratises the home by fostering gender equality in the organisation of homemaking routines. But a critical study of the narrativization and assignment of smart home agency reveals significant gender disparities.

Key words: Smart homes, domestication theory, gender and technology, agency scripts, feminist technology studies, Internet of Things, gender scripts.

1. Introduction

Designed to respond to householders' desires for convenience, entertainment, security, and energy management, 'smart homes' are households supported by individual smart gadgets or an interdependent home network enabled by internet-connected devices known as the Internet of Things (IoT). Domestic items are transformed into smart entities including voice-activated smart speakers, TVs, thermostats, refrigerators, robotic vacuum cleaners, locks, doorbells, security cameras, and lighting by fitting them with sensors and assimilating them into preceding domestic regimes and frames of reference (Hand and Shove 2004). Internet-connected via a hub, appliances are monitored and controlled on command, interacting remotely. However, smart home gadgetry is encoded with assumptions about "normal" household routines with the potential to actively *regulate* domestic life.

To generate a market for smart products, marketing and advertising texts mobilise powerful smart discourses to guide home use. For instance, Samsung's "SmartThings" offers a range of devices activated via its smart hub, to create and sustain domestic routines from morning to night. Samsung's promotional video presents a scenario that sequences fine-grained actions to orchestrate the rhythms of a "normal" day:

> 6:00 am: When you wake up in the morning, SmartThings can turn on lights, turn up the thermostat, turn on the radio and turn on the coffee machine.
> 9:00 am: When you're ready to leave home, SmartThings can lock all the doors, turn off all the lights, turn down the thermostat, and turn on the security cameras.
> 12:00 pm: While you're away from home, SmartThings can send you video alerts if there's unexpected activity, warn you if there's a water leak, and much more.

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6.00 pm: When you arrive home, in the evening, SmartThings can open your garage door automatically, adjust the colour of your lights, turn on your favourite music, and control your home appliances.
11.00 pm: And when you're ready to go to sleep, SmartThings can warn you if doors or windows have been left open, before then turning off all the lights and turning down the thermostat [1].

This smart home scenario serves as a useful point of departure for the following discussion. It foregrounds the level of interconnection, automation, and management of households proposed by smart gadgetry and the digital agency implied by smart discourses. The smart home promise of comfort, efficiency and convenience infers the easing of housework and impacts on the moral economy of the household in ways we are only beginning to understand.

However, research on smart homes and digital inequality is embryonic. We lack comprehensive information about smart home users: who they are, how they use the technology, with what motives and with what implications. Yet the adoption of smart home systems in the Global North is escalating fast. Forecasts suggest the global market size will rise by 2023 to US$153 billion with 18.1 per cent of households adopting smart technologies worldwide (Statista, 2018). Smart home marketing targets predominantly able-bodied, middle-class households with disposable income even though the elderly and those with protracted illnesses are the most likely beneficiaries (Deen, 2015; Liu et al. 2016). This article presents an original analysis of smart home marketing reports and advertisements to investigate how gendered relations are assigned and legitimated in these texts and to consider how they might influence and circumscribe domestic adoption. To enquire whether men and women are invited to participate equally or unequally in smart home technology, the analysis is framed by feminist technology studies and domestication theory and informed by secondary research on smart home adoption. We might be forgiven for thinking that smart technology democratises the home by fostering gender equality in the organisation of homemaking routines. But a critical study of how smart home agency is evoked and narrativized in promotional texts reveals significant gender disparities.

2. Gender scripts and domestication

Challenging the notion that technology is objective and neutral, feminist technology studies examines how scientific and technological thinking is framed by cultural, historical, economic, and social systems (Wajcman 2004; 2010). For example, the concept of "gender scripts" explains how gendered relations and identities are inscribed into the design of technology. Design decisions and procedures influence user representations, consumption, technological frames and domestication by steering users to perform according to gendered norms (Oost 2000, 2003; Oudshoorn et al. 2004; Rommes et al. 1999; Rommes 2002). These scripts can be negotiated and contested but they have the power to sustain prevailing gender disparities. As Wajcman states, across multiple sites, "the materiality of technology affords or inhibits the doing of particular gender power relations" (Wajcman 2010: 150). Studies of smart homes indicate that gender inequality is preserved by cultural preconceptions at the level of software design (see Draude et al. 2019; Bardzell and Bardzell 2011; Leavy 2018; Perez 2015, 2019). Despite assumptions of their objectivity, the algorithms that control smart technology "are inescapably value-laden and developers specify operational parameters, which users configure with desired outcomes in mind that privilege some values and interests over others" (Taylor 2018: 42). For example, speech-recognition software for Amazon Echo and Google Home is based on men's voices. As a result, Google Home is 70 per cent more likely to respond to men and ignore commands from women (Perez 2019). Similarly, Apple's HealthKit, designed to

1 Samsung SmartThings video available at https://www.smartthings.com/uk/smart-home [17.07.2020].

track adults' personal health on an iPhone, disregarded gender-specific data. By overlooking the menstrual cycle, it failed to track half the population's health (Perez 2015). Resulting from what Perez calls a "gender data gap", this bias preserves the status quo.

Gender scripts in software design are carried through to the level of marketing with consequences for the technology's domestication. Domestication studies of communication and information technologies (ICTs), from telephones to computers and the internet, reveal that individual negotiations of gendered identity influenced the integration of technology into domestic routines (see, for example, Aune, 1996; Bakardjieva, 2005; Bergman and van Zoonen, 1999; Lally, 2002; Peil and Röser 2014; Rakow 1992; Silverstone et al. 1992; Ward, 2005). For instance, studies of 1990s home computers found that men tended to relate to the new technology as a complex, auspicious tool and an opportunity to express masculinity. Women, however, tended to view it as part of routine office work (Haddon 2006; Oost 2000). Emphasising the agency involved in decisions to purchase and absorb technologies into home routines, domestication theory explains how context of use acquires gendered connotations (Lie 1995 Oost 2000). Domestication entails four elements of adoption: commodification, objectification, incorporation and conversion (Silverstone et al. 1992: 21). Commodification addresses the initial stage of buying and acquiring the technology, influenced by marketing. Objectification refers to the positioning and arrangement of equipment in the home while incorporation explains how the technology is integrated into, and shapes, domestic routines. Conversion reconnects the domestication process to wider society through display, sharing and dialogue about the technology (Silverstone, 2006).

How the technology is integrated into home routines depends on the "moral economy" of the household. Contrasting with the economic exchanges of the formal economy, these moral exchanges involve values and norms that form a discrete domestic culture which steers household routines. The moral economy determines the use of ICTs and how they remake home culture (Silverstone et al. 1992: 16-20). The concept of "use genres" developed by Bakardjieva explains how domestic technologies are often repurposed in ways unanticipated by designers and marketers to correspond with households' values (Bakardjieva, 2005: 138; cf. Wajcman 2015; Green and Haddon 2009). However, IoT-oriented smart gadgetry is an entirely new kind of technology, one involving interconnections between a suite of integrated devices operated in and beyond the home. These interacting and spatially distributed devices are domesticated in ways that differ substantially from earlier technologies. Domestication theory therefore needs to be modified to explain "the potentially networked nature of the domestication process" (Brause and Blank 2020: 11). For example, in their study of early adopters' uses of smart speaker assistants (SSAs) such as Amazon Echo (Alexa) and Google Home, Brause and Blank extend "use genres" to include "externalization". They explain that the "networked, dispersed, always-on and possibly remote" nature of connected home technologies involves the domestication of other devices and re-defines the boundaries between home and the outside world (ibid.: 9). The spatially distributed network abilities of SSAs affect all four domestication stages. This "externalization is itself influenced by the moral economy and domestic culture with its own values and interests…" (ibid.: 10). The authors also discovered a new use genre: "after submission we found a news account of a husband using SSAs and connected devices to remotely spy on his wife at home" (ibid.: 9)

Domestication theory raises questions about how householders are summoned, via marketing strategies, to engage with smart technology at the initial commodification stage of domestication, and how this stage guides and sets limits on the following domestication stages. As Oost states, "[b]y creating links between the advertised object and (sub)culturally accepted masculine or feminine symbols, advertisers hope to seduce the targeted group to buy the product. At the same time, they actually construct gender and the means to perform gender"

(Oost 2003: 194). The article comprises two distinctive paths of enquiry. First, it provides an original analysis of the commodification phase of domestication, a phase which remains underdeveloped in technology usage studies and domestication research in general. Second, the analysis is supported by an assessment of existing smart home adoption research.

Drawing on the script approach advanced by feminist technology studies, the first section employs the concept of "agency script" as a heuristic tool. It explains how householders' smart actions are conveyed and assigned within marketing reports and advertisements to galvanise and steer distinctive modes of smart home adoption. Agency scripts, activated via smart scenarios, stabilise the meanings and functions of smart technology. They perform the pedagogic role of steering and delineating the symbolic and practical implementation of smart home technology. Exemplified by the Samsung scenario introduced at the start of the article, smart scenarios are sequences of micro-routines that show how the technology is to be set up and used in the home. As a key marketing strategy, these scenarios are framed by smart discourses that generate agency scripts. The agency scripts embedded in smart scenarios correspond with gender scripts by carrying use codes. These codes are determined by the intertwined conduits of design and marketing. Rather than materially shaping the technology's gendered design features, the use codes immersed within agency scripts are discursively layered over gendered design scripts. Shaped by distinctive ideals and values, they *reinforce* gendered design features by reproducing and invoking the gendered materiality of smart technologies at a symbolic level. As such, the concept of "agency script" supports an analysis of how smart discourses incentivise householders' gendered smart actions at the commodification stage of domestication.

The following analysis of marketing reports and advertisements explains the pedagogic role of agency scripts which coax and coach householders *how* to domesticate this complex IoT-operated technology. The agency scripts embedded in smart scenarios infer smart use genres by prescribing domestic routines that affect the moral economy of the household. Although smart discourses imply that this digital technology lessens household chores to free up householders' time, smart scenarios' agency scripts perform both figuratively and literally as *gendered* scripts. The evidence below suggests that smart home discourses work to mobilise men as initiators and controllers of the technology.

3. The smart discourses of promotional texts

To investigate smart technology discourses, three types of smart home promotional texts issued between 2016 and 2020 are analysed: (i) professional institution reports on IoT policy challenges, consumer surveys and marketing reports that advise suppliers and adopters of IoT products and services how to yoke the economic potential of IoT ($N = 6$); (ii) audio-visual advertisements of smart homes ($N = 20$); (iii) related textual material from company websites ($N = 9$). Key terms and accompanying smart scenarios within smart reports and advertisements are examined to determine how they prescribe the adoption and use of smart home technology. Guided by feminist technology studies and domestication theory, a discursive approach supported by an interpretive content analysis explains how these promotional texts develop subject positions alongside wider ideological and political processes of legitimation and power. Discourse is broadly conceived as a system of representation involving both language and practices that produce meaning (Hall 1997: 17) with performative effects (Du Gay et al. 1997).

Smart home marketing reports function to support and endorse the smart home industry, using a language of incentives and smart scenarios to identify uses. As the key tag, the word "smart" is supported by chains of persuasive buzzwords and pronouncements to promote this complex technology including "comfort", "convenience", "efficiency", "effortless-

ness", "benefits/beneficial", "intelligent", "sophistication", "enabling", "trust", "solutions", "harness", "autonomous action", "performance", "seamlessness", "monitor", "control', "home security", and "connectivity". Employed in various sequences, these value-laden terms are introduced and framed by bolder, totalising concepts such as "vision", "smart world", "culture of convenience", "transformation", "ecosystem", "movement", "the future'", "tomorrow", "progress", "giant leap" and "global agenda". Collectively, this promotional vocabulary comprises a distinctive smart home rhetoric that generates a grandiose set of techno-social expectations.

In its report, *The Internet of Things: A Movement, not a Market*, international information provider IHS endorses IoTs unreservedly by describing IoT as a "movement" (IHS Markit 2017). Used 10 times in its 8-page report, the word "movement" presents IoT as both a cause and a cradle of change while the word "future" (5x) invokes inevitable progress, supported by images of smart cityscapes. Likewise, in the Royal Academy of Engineering (RAoE) report, *The Internet of Things: Realising the Potential of A Trusted Smart World*, the notion of a "smart world" proclaims a global trajectory, with "global" mentioned 38 times in its 52 pages (Taylor 2018). IoT enabled technology is conveyed as irresistible and unstoppable. TechUk goes a step further on its website, by talking of "bettering the whole planet".[2] Its report, *The State of the Connected Home*, depicts smart home technology as part of "the world that we will live in *tomorrow*" (2019: 2). These totalising catchphrases form a common strategy to legitimise and authenticate the technology. They set the stage for smart technologies as a global agenda, one that is futuristic, crusading and game changing.

3.1 Smart technology marketing reports

To boost the market, consumer reports are purposed to reflect on why consumers may be reluctant to buy smart home technologies. Key problems are identified: high costs; unclear benefits; privacy, trust and cyber security; complexity and technology risk. In response, certain buzzwords figure repeatedly to invalidate these barriers and drive a positive smart narrative. For example, in TechUk's 24-page report, the word "benefit" is repeated 9 times. But the benefits identified remain vague. The word slides between benefits for business and benefits for consumers. Possessing power, taking charge, and directing this technology comprise agency scripts. Yet they are conveyed without shedding light on the nature of the actions, who benefits from them or how. We are led to assume that what is good for business is inevitably good for households.

In the 52-page RAoE report (Taylor 2018), the word "solution" – deployed 49 times – hails smart technology as the "solution" to home problems without clarifying the problems that "solutions" tackle. "Solutions" waver from the augmentation of imprecisely defined "lifestyles" to the enhancement of imprecise routines, to abstract notions of "efficiency" (23x) and "benefits" (or "beneficial") (73x). "Benefits" (of IoT), linked to "solutions", are identified first for businesses and stakeholders, and then consumers. Energy benefits are the most tangible gains identified. While this level of elusiveness is surprising, it characterises smart technology reports. Likewise, the international report, *Intelligent Efficiency: A Case Study of Barriers and Solutions – Smart Homes* (EDNA 2018) begins, predictably, by admitting to the ambiguity associated with "smart homes" and the barriers that impede adoption. However, criticism is closed down by the catchphrases "intelligent efficiency" (66x) and "solutions" (32x) in its 55-page report. The term "solutionism", developed by Morozov (2013), refers to the use of technology to solve problems that either never existed or that form

2 TechUk website available at: https://www.techuk.org/about [17.07.2020].

part of highly complex social-cultural and political issues. This solutionist narrative hides the ideological dimensions of technology to present the idea of attaining a perfect life. Performing as rhetorical tropes to raise techno-social expectations, these confusing catchwords fetishize smart technology (Roderick 2016; Xenitidou and Gunnarsdóttir 2019).

Sustained by such catchwords, a series of smart scenarios accompany the US-based McKinsey and Company report, *There's No Place Like A [Connected] Home* (McKinsey and Company 2017). A sequence of colourful abstract images of family members using smart devices around the home appear on a side panel. These images convey the active role of a husband as installer of the equipment. Under 'Everything Smarter', the husband is shown installing the home hub, looked on by his wife. Similarly, to show how smart technology is to be used, a consumer report by PWC, *Smart Home, Seamless Life: Unlocking a Culture of Convenience* (PWC 2017) employs a written smart scenario to present a distinctive agency script that regulates and circumscribes domestic routines:

> Your alarm rings. You hit the snooze button a second time, **triggering** your coffee pot to start brewing and your lights to turn on gradually. You didn't sleep well; your mattress **senses** this and **signals** your coffee pot to select espresso. Finally out of bed, you pad barefoot to the bathroom, your soles savoring the heated tiles. They're **programmed** to warm up when the alarm **rings** and outside temperatures have dropped below 50 degrees. Out of the shower, an outfit [is] **recommended** by your closet based on the information that it's cold outside and you're tired from a bad night's sleep.
>
> Dressed, you enter the kitchen… what a relief your refrigerator notified your husband yesterday to pick up eggs - the only food your picky 3-year-old daughter Susie will eat. You scramble to get her clean, dressed, and at pre-K on time. Her favorite music, already **playing** in her bedroom, motivates her to get going. … .your refrigerator **beeps**. Oops, that chicken you bought a few days ago will spoil unless you cook it soon. The refrigerator **recommends** recipes based upon ingredients you already have…You select a slow-cooker recipe and toss everything in. Your phone will remotely **turn it on** when it's time. Yikes, it's 7:15am—go time. Your car **turns on**, pre-heating. Your garage door **opens**. Your home's thermostat **drops** to 62 degrees while everyone's out, and the TVs in every room **turn off** automatically….
>
> By 7:30am, you and Susie are in your toasty, **pre-heated** car, with your GPS system activated to select the best route to avoid construction and congestion. Susie's favorite music from her bedroom is now **playing** in the backseat, and as you drive away, you marvel at how you ever functioned before your house and car were smarter than you. (PWC 2017: 2; My emphasis).

Twelve actions steer the micro-routines in this detailed scenario, conveyed by a selection of action verbs: "trigger", "sense", "signal", "programme", "recommend", "beep", "turn on/off", "open", "drop", "pre-heat", "play". The idea of "marvelling" at how the house and car are 'SMARTER THAN YOU' implies that an omnipotent intelligent force alleviates household labour. While mobilising agency scripts, the tasks to be performed by the mother are omitted from the scenario. Wakening and dressing the daughter, buying food, scrambling the eggs, driving daughter to school and shopping are disregarded tasks which smart technology does not relieve. Hyperbole drives the scenario's narrative to imply that these household duties, normally assumed by women, are somehow offloaded. Accompanying the liberal interleaving of catchwords such as "convenience", "benefits" and "solutions" in reports, smart scenarios imply that smart home gadgetry can lessen the strain of housework.

Earlier research has critiqued the misleading industry claims of easing housework (Berg 1994; Chambers 2016, 2020; Heckman 2008; Richardson 2008; Spigel 2005). For example, a study of consumer magazine and online articles about smart homes by Strengers and Nicholls reports that: "…reducing housework was commonly alluded to by the term 'convenience', which is embodied in all smart home devices, such as automated lighting, climate control, seamless and integrated entertainment, security and water systems" (Strengers and Nicholls 2018: 94). The authors found, however, that less than 5 per cent of primary images showed actual household labour performed. Smart home tasks such as alerting householders when the

washing cycle ends and meal planning based on the food already in the fridge imply, yet are not, actual housework tasks. The word "convenience" sanctions existing gendered archetypes by promising "housewifely" procedures to present smart technology to men as a "wife replacement': "It acts like, thinks of, and performs the types of tasks most stereotypically performed by a 1950s housewife" (Strengers and Nicholls 2018: 75).

This notion of a replacement housewife is inferred in The McKinsey and Company report (2017) which abandons the goal of reaching women by focusing on the male adopter. Its smart scenario follows a day in the life of a fictionalised subject, Jim, "to better understand the consumer's perspective on connected homes". Jim's day is divided into precise time slots for the smart industry to address barriers to seamlessly automated tasks:

8.00, Waking up, Jim gets the weather of where he is, but not where he is going. He needs to **manually look it up**.
8.30: Jim interacts with multiple 'smart' devices that **don't work together** and have clunky interfaces.
1.45: Jim needs to pick up supplies but needs to **call the store directly** to check stock.
5.30: About to leave work, Jim **cannot check in advance** what chores need to be done and automate them.
8.30pm: Entertaining his friends later that night, Jim **cannot get music** to stream from his phone to his 'smart' entertainment system. (McKinsey and Company 2017; My emphasis).

To gauge consumer attitudes towards smart home systems and devices, the PWC's American survey of 1000 adults confirms that at 32 per cent, "Excitement is highest among men, consumers aged 18–24, and high-income households" (PWC 2017: 24). These adopters are:

Middle-aged (ages 30–49), Married with kids; Higher household income; Technology enthusiasts; Typically the first of their friends to try new tech products; Feel strongly that they spend way too much time taking care of their home; Feel they rarely have enough time in the day to do all they need to (ibid.: 25).

So-called "considerers" are also men: "Young (ages 18–29)". For women, who typically run the household, convenience is identified as a persuasive reason for smart home adoption. However, women are not identified as "current users" or "considerers", but rather as "acceptors" (28 %) or "rejecters" (23 %) even though "convenience", "efficiency" and "benefits" are promised. PWC's flippant advice to promote smart homes to women is: "Rather than push devices, push a lifestyle - offer reminders, so there's one less thing to remember, or an extra set of hands for when life gets crazy, etc" (ibid.: 26). Since the technology does not ease housework, women must be coaxed by a lifestyle image.

3.2 Smart home advertisements

Audio-visual smart home advertisements reiterate marketing reports' messages by following the smart scenario strategy as a pedagogical tool to educate householders. First, energy efficient, affluent homes with floor to ceiling glass windows and minimalist styling are regularly presented. Inhabited by mainly white professional middle classes, they convey comfort and leisure. A second dominant theme is the association of men with freed-up time while women tend to be associated with security, baking in the kitchen, or simply figure in the background. This is exemplified by a 59-second promotional video called *Sands of Time* (2018) produced for transnational smart home automation company, Loxone.[3] It depicts a smart scenario, with an hourglass of flowing green beads to symbolise passing time. A spacious, open-planned home is described by the voice-over "an intelligent home that handles more than 50,000 tasks a year and gives us back the only thing that is irreplaceable: TIME". Accompanying the hour-

3 *Sands of Time* (2018): https://www.youtube.com/watch?v=kSwxu8R5MrE [17.07.2020].

glass, digital numbers rotate up to 50,000. Interlaced with shots of smart devices, a husband is the active agent followed around the home while engaging in some of these 50,000 tasks: slow cooking in the kitchen, interacting with his son by repairing a skateboard, reading to his daughter at bedtime. The wife is spotted relaxing, reading a book, implying that she can relax while her partner takes responsibility for the household chores and childcare. Such scenarios draw attention to middle-class professional men's opportunities to play with kids and slow cook as manly entitlements and rewards. However, although it assumes the imminent erosion of gender-bound domestic labour, this expectation conflicts with the evidence outlined below. Positioned as by-standers, women lose the skills and agency to operate smart home devices.

A third advertising trope depicts men as expert smart adopters and executors, exemplified by *Introducing Amazon Echo* (2016).[4] A father/husband, staged as a professional worker and executor of the smart home, collects the voice-activated virtual assistant, Amazon Echo, from the postman, sets up the gadget and explains its function to his intrigued family. Each family member bellows instructions at Alexa. Father explains, "It uses far-field technology so it can hear you from anywhere in the room". The daughter explains: "Dad really likes the Echo just plugged in, so we never have to charge it. Plus, Echo's really good at keeping track of things like shopping and to-do lists." Baking a cake, mother asks Alexa for recipe guidance. Alexa awakens family members via its alarm. Waking, the father asks Alexa for his day's flash briefing. Later, Alexa assists the children with homework. The advert ends by claiming authoritatively that: "With everything Echo can do, it's really become part of the family". Although the device is domesticated as "part of the family", the father is identified as the active adopter and smart agent.

The interpellation of men as smart experts is also exemplified by "Amazon Alexa: Coming Home" (Oct 2019).[5] We are introduced to a white, middle class man driving his car in the evening. Whilst driving, he instructs Amazon Alexa to switch on the central heating, lights, and music at home. The scene shifts to an open plan kitchen where lights and soothing music switch on, apparently to prepare for his arrival from work. The front door opens but it is his wife who enters a warm, welcoming house. Via Alexa, she speaks to her husband still driving his car: 'Thanks, hun'. The accompanying information states: "With Echo Auto, you can play music and your favourite podcasts, ask Alexa to control your smart home, and stay connected with those you love without taking your hands off the wheel." By demonstrating the technology's externalising features, male smart agency is presumed while the wife's agency is negated. Why is she unable to operate the smart home herself?

Advertisements' smart scenarios generate agency scripts to present a set of recommended micro-routines that domesticate the technology and standardise routines. These scripts perform as a mode of corporate pedagogy to "educate" householders to this new smart world. The needs of women are either sidestepped or regulated by male partners. The term "corporate pedagogy" forms part of public pedagogy, a concept developed by Henry Giroux that refers to "a powerful ensemble of ideological and institutional forces whose aim is to produce competitive, self-interested individuals vying for their own material and ideological gain" (Giroux 2004: 497). Underpinned by a language of technological progress, smart home discourses play "a central role in producing narratives, metaphors, and images, and in desiring maps that exercise a powerful pedagogical force over how people think about themselves and their relationship to others" (Giroux, 2004: 498). Whether explicitly or implicitly, the pedagogical nature of smart home scenarios summons masculinised agency. By appealing pre-

4 'Introducing Amazon Echo' (2016): https://www.youtube.com/watch?v=CYtb8RRj5r4 [17.07.2020].
5 'Amazon Alexa: Coming Home' (2019): https://www.youtube.com/watch?v=vPOfbhRQpMk [17.07.2020].

dominantly to men as expert adopters, as householders most deserving of leisure time, the needs of women are either bypassed or controlled by male partners.

4. Masculinised 'tech work'

Since promotional texts infer that smart gadgetry eases domestic work, we might assume that smart technologies overcome household gendered inequalities. On the contrary, research accords with feminist technology studies: that smart expertise tends to be shaped by gendered desires and interests. Studies of home internet adoption identify men as adopters. Men are nominated as the expert in male-female relationships, even if they have limited internet knowledge. Pinpointing continued inequalities, this gender difference is "repeatedly constructed by both partners as part of a 'doing gender' process taking effect in the home" (Peil and Röser 2014: 241). This resonates with earlier studies of automated homes (Berg 1994; 1997; Takayama et al., 2012; Tolmie et al., 2007). More recent findings concur that male householders typically lead on decisions to install and manage smart home technology (Kennedy et al. 2015; Strengers and Nicholls 2018).

The domestication of smart systems requires specialised knowledge and skills. It demands considerable labour in terms of planning, setting up and maintenance. The interest-based nature of smart labour offers the male executor a sense of satisfaction, particularly when leading to well-organised lighting, entertainment, and security operations. Despite the effortless elegance of smart home scenarios, however, the technology is consistently found to be unreliable. Irrespective of whether systems are installed professionally or as do-it-yourself projects, they involve installation problems, interventions and disruptions, maintenance and monitoring of numerous devices, repairs and upgrading, and teaching other householders how to use them (Strengers and Nicholls 2018). On occasion, the digital housekeeper must reset the system to fix bugs while services like robotic vacuum cleaners get tangled or stuck. One couple, in a study of 22 Australian households, were baffled by the wireless doorbell buzzing whenever the living room lights were turned on (Kennedy et al. 2015: 412). These tasks absorb the digital housekeeper's time. Although this labour is usually considered by men to be rewarding, it becomes normalised as a new kind of domestic labour referred to as 'digital housekeeping' (Kennedy et al. 2015: 408) or gendered 'tech-work' (Strengers and Nicholls 2018: 78). Census surveys on home-based digital tasks verify gender imbalances in household tasks (ONS 2016) and smart home adoption (UK consumer digital index 2018).

As the digital housekeeper becomes preoccupied with maintenance, shut-downs, repairs and fault spotting, other householders are ensnared in its effects. Regular interruptions to home life imposed by "smart malfunctions" (a notable oxymoron) involve trade-offs against other household activities. As novices, women tend to defer to partners or husbands as the "warm expert" (Bakardjieva 2005) to gain access to the competences required to operate the gadgetry, sort out smart glitches and conserve time for "their" household chores. Women are therefore inclined to lose the incentive to acquire the skills to function the technology (Kennedy et al. 2015). They become burdened with more housework duties while working around smart disruptions and, eventually, excluded from the technological process. Corresponding with gender scripts, these dynamics reflect agency scripts that reinforce gendered divisions between "digital" and "traditional" labour. On average, women continue, in this digital age, to spend around double the amount of time on unpaid cooking, childcare and housework than men (ONS 2016).

This gendered division of labour between technical and conventional household tasks reflects pre-internet studies of the gendering of domestic technology. In her study of the domestication of the video cassette recorder (VCR), Gray (1995) found that, regarding themselves as less capable, women relied on male partners to set the device. Identifying distinct

material constraints and relations of power, Gray revealed that, in passing technical tasks to their partner, women often displayed "calculated ignorance". Women admitted a deep-seated sense of inadequacy or remorse when referring to the technicalities of operating the VCR. This response does not simply derive from the inherently "masculine" nature of the equipment. It corresponds with the gendering of media technology as part of the moral economy of the home. Reflecting earlier ICT studies, a focus on smart discourses and practices reveals that digital labour is inscribed with symbols, metaphors and values that have masculine connotations: "the very language of technology, its symbolism, is masculine. It is not simply a question of acquiring skills, because these skills are embedded in a culture of masculinity that is largely conterminous with the culture of technology" (Wajcman 2007: 289). Undercutting the logic of smart homes as a "solution" and a "convenience", the evidence suggests that the micro-routines mobilised by smart scenarios fail to ease domestic labour traditionally performed by women. Reluctant or powerless to relate to this masculinised smart agency, women encounter the smart home as an alien and precarious space.

This gendering of tech-work coincides with industry perceptions of men as the archetypal "smart citizen". Men are targeted as the ideal neoliberal subject, mobilised as agents of their own decisions. By presenting the technology as a form of entrepreneurial recreation, the agency scripts assigned in smart scenarios summon *masculinised* agency. They beckon the enterprising man, described by Strengers (2014) as "Resource Man". Within a masculine use genre of objective technical rationality, smart imaginaries appeal to men as "gadget fiends" and amateur technical hobbyists who seek a sense of technical mastery over the home (Haring 2007: 51; Hilton 2003: 202; Peil and Röser 2014). Functioning within neoliberal regimes of work and self-productivity, this masculinised smart agency engenders individual 'responsibilisation' (Rose 1992; 1999).Thwarting more civic-oriented, collective views of home life, the onus is placed on the individual male householder to improve his wellbeing, his lifestyle, his family.

This gendered imbalance of power in the home, in favour of men's smart agency, impacts on the moral economy of the home. The whole household becomes defined, networked and reorganised from his standpoint and according to his individualised values and interests. This changes the power dynamics of the whole household, particularly in cases of relationship breakdowns and intimate partner violence (Dragiewicz et al. 2018; Lopez- Neira et al 2019; Tanczer et al. 2018). Smart home devices are increasingly coming to light in domestic abuse cases. Since men usually take charge of passwords, many women lose control over their whole home environment. Coercive control against women often occurs from beyond the home after the perpetrator leaves. Victims report loss of control of Wi-Fi-enabled front doors, smart speakers, thermostats, lights, and cameras, finding thermostats switching off or raised to 100 degrees; music suddenly blasting from smart speakers; code numbers of digital front door locks changing daily; or doorbells ringing for no apparent reason (Tanczer et al. 2018; Chatterjee, et al. 2018). The UK's largest domestic abuse charity, Refuge[6], uncovered 920 cases of smart home gadgets used against women in abusive relationships between January and August 2018 (Lopez-Neira et al. 2019). Although IoT use in the home is escalating, research on the risks posed for women remains sparse.

5. Conclusion

Operating within a powerful set of corporate priorities, smart home gadgets are lucrative products that form part of a broader vision of hyperconnectivity, one that supports IoT indus-

6 See: 'Tech Abuse', https://www.refuge.org.uk/our-work/forms-of-violence-and-abuse/tech-abuse-2/ [17.07.2020].

tries, smart city projects and social policy. The smart home claims a stake in this global IoT project but is not just a side-line attempt to marketise "home". While domestication scholars emphasise that technologies are open to interpretation by their users, the commodification phase has remained underexplored. Employing the "agency script" concept, this analysis indicates that smart home discourses have critical agency with consequences for a household's moral economy. Smart technology is often depicted as neutral, depersonalised, and anonymous. However, corresponding with design gender scripts, smart discourses mobilise gendered agency scripts to define and circumscribe use codes at the domestication stage. They steer householders to organise and fix domestic routines according to distinctive gendered subject positions. The article indicates that rather than equalising gender relations and democratising household dynamics, smart home agendas work to reinforce gender divisions.

Three key themes and issues emerge from this study.

First, smart discourses prescribe smart solutions to ill-defined problems. Within the drive to inhabit and colonise the home, the speculative and grandiose rhetoric of promotional texts promise inevitable progress, reduced housework, and enhanced lifestyles. Smart home discourses' inflated claims of easing domestic labour are unsubstantiated.

Second, although reproductive work is invisible in most smart home scenarios, smart home technology adoption generates more domestic labour via tech work. This intensifies the gendered division of labour between digital and traditional housework. While smart scenarios perform as a mode of corporate pedagogy to steer domestication, they do not present women as competent users of smart homes. Instead, they appeal to men as tech-savvy subjects by conferring on men the role of resourceful gatekeepers of the smart home. Agency scripts summon men as archetypal "smart citizens". However, by mobilising men as smart agents, agency scripts bypass the needs of women which circumvents their potential agency. Women lack, or are denied, the time and inclination required to claim, activate, and direct the technology. This impacts negatively on the moral economy of the household. The uses of smart home technologies by women and men may not conform to marketing representations. But research evidence on gendered encounters with smart home technologies points to gender-differentiated use.

Third, the marginalisation of women – both at the design stage, via gender scripts and the marketing stage, via smart scenarios – can render women technically ineffectual and vulnerable. This can generate specific risks for women. If tech work is mainly conducted by men, women can experience "home" as a disempowering, precarious space. These domestic encounters and affiliated agency scripts signal the need to identify effective measures to challenge gender bias in both the design and marketing of smart home technology.

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