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Everyday domestic water and energy consumption in Shanghai homes: The resurgence and persistence of gendered practices in China

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ABSTRACT

China's ecological civilization centralises households as a unit of intervention for environmental policy. The household constructed within such policy reduces complex social arrangements and processes and results in efficiency and behaviour change interventions. Such interventions have had limited success and contribute to reproducing inequality. This paper uses ethnographic methods to develop insights into everyday practices that consume energy and water within homes in urban China. In doing so, understandings of both the responsibilities and temporalities of labour for these practices are developed, and the entanglement of these practices across diverse policy arenas is explored. Focusing upon water treatment, cooking, dishwashing, and laundering - this paper demonstrates not only how women have a much greater responsibility for such practices, but that the importance of women's labour is considered greater for practices in which hygiene is considered critical and contributing to health protection. Gendered labour is connected to the resurgence of Confucian gender ideologies within CCP policy and discourse post-1968. The exacerbation of anxieties around the health of children is further connected with parents experiencing pressure in raising their children as 'high-quality citizens'.

1. Introduction

Within China's ecological civilization policy households are considered intervention spaces to deploy environmental policy and green technologies [1,2]. Households are defined as a pertinent space for intervention considering they are responsible for 24.7 % of final national energy consumption [3] and 35 % of urban water consumption [4]. However the household imagined within such interventions is homogenized and rationalized, with interventions reduced to efficiency and behaviour change measures [5–7]. Global scholarship on such interventions have demonstrated limited levels of success in managing domestic consumption [8,9], as well as unintended consequences including consumption rebound [7,10] and exacerbating gendered labour inequalities [11,12].

Sustainability scholarship increasingly recognises the need to go beyond rationalized accounts of 'household' and move into more situated understandings of 'home', recognising home as a permeable and complex space where multiple processes and factors collide and shape often gendered everyday life and practices that consume resources [13–18]. Within this work there is also growing scholarship emphasising the need to understand how the home is not only entangled with resource-related and environmental policy, but also "the ways in which priorities and objectives across diverse policy arenas [non-resource policy] are embroiled in creating and sustaining demand" ([19], p2). More complex accounts of the home will extend opportunities for intervention beyond technoeconomic measures implicated through narrow readings of households [20,21].

Drawing upon this work, this paper develops more complex accounts of energy and water resource consumption in 35 homes in Shanghai, China, understanding the gendered temporalities and responsibilities of everyday consumption practices (water treatment, cooking, dishwashing, laundering) and exploring how such practices are entangled with non-resource policy ([19], p2). Women's disproportionate responsibility for these labours and particularly for laundering and water treatment, which are considered vital forms of health protection within the current infrastructural and political regimes governing Shanghai, is entangled with resurging Confucian values on the home and family that are embedded within policies and ideologies of the Chinese Communist Party and that are central to China's economic transition. Health anxieties around child raising that drive both domestic labour, and water

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and energy consumption, are connected to both the production of high-quality citizens and demonstrable absence of policy environments to protect children's health.

Through these empirical findings, this paper contributes to providing more nuanced and in-depth understandings of domestic energy and water consumption and labours of such consumption in homes in Shanghai, important for challenging the homogenous household prominent in ecological civilisation policy within China. It also contributes to an increased recognition of the entanglement of non-resource policy with the everyday practices that consume resources within the home. Taken together, these contributions produce the following question: if every day domestic practices of consumption are connected to non-resource policy central to China's ideological vision of a modern and prosperous society, what are the implications for sustainability interventions – both current and future?

2. Literature review

2.1. Household-as-consumer and implications for interventions

Governments have increasingly framed households as a focus of environmental sustainability policy [7,22,23]. Within such policy, households are constructed as homogenous, rational and self-regulating units that will implement behaviours deemed necessary for reducing consumption [11,24]. Such a construction of household, and consumers within them [25], is the outcome of masculine histories of water and energy discourse dominated by techno-economic epistemic communities who deem households and consumption as quantifiable and knowable [16,26,27]. Narrowed conceptualisations of a quantifiable and knowable household commonly means spaces for intervention are reduced to techno-efficiency measures and behaviour change initiatives that are applied universally across households [19,28,29].

Techno-efficiency – informed by engineering and natural sciences [19] - seeks to reduce the environmental impact of household consumption, such as through solar panels, insulation, water tanks, and smart meters [30], whilst behaviour change programmes, stemming from economics and cognitive science, tend to focus upon nudging households to 'go green' within their consumption [31]. Such interventions are also commonly politically uncontroversial as they are not seeking structural changes and are generally normalising pre-existing provision of services [10]. There is recognition, however, that despite growing techno-economic and behaviour change interventions, efforts to reduce domestic resource consumption have failed, had limited success, or had unintended consequences [8,19,29,32]. Unintended consequences in terms of exacerbating women's domestic work and the rebound effect are discussed below.

When sustainability policy and interventions are informed by uncritical constructions of the household they can exacerbate pre-existing inequalities and particularly unequal gendered labour distribution [11,33–35]. When environmental sustainability interventions are devolved to the household, necessary labour is generally predicated upon the already feminized nature of domestic practice [34,36,37], thus commonly responsibilising women for environmental sustainability, increasing women's unpaid labour burden, and exacerbating preexisting time poverty [12,38]. Recognition of women's labour in such environmental sustainability interventions, with limited considerations of its implications on women themselves, means that women are even being identified as explicit targets for such labour [12]. For example Tjørring [39], on investigating chore flexing for flexibility of electricity consumption in Denmark found that when women are targeted with text reminders, they responded better than men and so should be policy targets.

Consumption rebound occurs when efficiency measures, whether technological or economically driven, are implemented, as total energy and/or water consumption will often increase [40,41]. This is because increased efficiency can contribute to an agenda of economic growth which in turn results in increasing resource consumption [41]. Concerns regarding rebound, however, need to be incorporated critically, recognising that whilst low-income groups often demonstrate the highest levels of rebound, this is often to meet levels of basic needs and improve health and quality of life [42–44]. Conversely emissions associated with the rebound effect at the higher end of the wealth spectrum tend to be related to hyper-consumption (Ray [45]).

In parallel to international trends, in 2007, the CCP National Congress adopted 'ecological civilisation' as a central policy objective, recognising China's rapid economic growth as environmentally deleterious and building upon Taoist philosophy of people living in harmony with nature for a post-industrial green and prosperous future [46]. In practice, ecological civilisation is interpreted as finding technological solutions to reduce the environmental costs of growth, including through consumption efficiency [46]. Recognising households as significant resource consumers, domestic efficiency measures have been implemented through tiered utility pricing, minimum efficiency performance standards for household appliances and the introduction of government subsidy schemes for such household appliances [47–49]. An underlying tenet of ecological civilisation is that whilst growth should not be at the detriment of sustainability, simultaneously sustainability should not hold back growth [50]. However, this focus is problematic. The rebound potential for Chinese households, and particularly middle-class urban households, is considered significant and consumption targets will not be achieved through only implementing programs to improve resource consumption efficiency [51,52].

2.2. Beyond household and into home

Recognising the limitations that household offers in terms of a conceptual space within sustainability and environmental policy, through its production in histories of masculinist techno-economic epistemic communities, this research draws upon work by feminist scholars to move into the home [16,36]. The home is understood as a materially and socially permeable space, with everyday practices within the home - including those that consume water and energy such as cooking, cleaning and laundering – entangled with broader social and political processes and material conditions [5]. This understanding of home is the outcome of feminist scholarship that has problematised understandings of home as private spaces of refuge, supposedly separate from the public sphere [53], where the physical materialities of housing have historically been considered to keep out both natural elements, like wind and rain, as well as the social processes and politics of wider society [54].

The permeable nature of home is also reflected in Chinese scholars work on the home and family and *nei* (inside) and *wai* (outside) which are comparable, though not identical, to Western conceptualisations of private and public [55,56]. This scholarship has demonstrated the socially constructed nature of *nei* and *wai* through the boundaries of home and the perceived privacy extended to *nei* changing over time [55–57]. For example, in Maoist China, boundaries of inside and outside were socially and materially reconfigured in order to expand state control into the home [58,59]. Privacy, particularly with regard to indoor space, was considered bourgeois and housing and communities were designed to regulate behaviour through reporting of others, as well as self-policing [58]. Since reforms commenced in 1978 and the perceived withdrawal of the state from private life through rolling back of social provisioning systems, the Chinese home has increasingly been invoked as a private space into which citizens have and can retreat [58,60].

Whilst the home is increasingly perceived of as a place of privacy and retreat, a number of China scholars recognise its continued permeability to state intervention, albeit more surreptitiously through policies and projects of state propaganda [61,62] as well as through social life, such as resident committees and through schools. The home as a matter of national concern is explicitly reflected within CCP ideology with the common use of phrases such as "The world is in the country, [and] the country is at home" [61]. The permeability of the home to state

intervention through policy and propaganda is not unique to China, there are components of this governance dynamic in many authoritarian and democratic regimes, albeit levels of intervention are potentially more directly observable in China. Policies are made expressly to govern social life, including within homes, and propaganda exists in influence and further political agendas. The permeability of the home, both within China as well as more broadly, means that every day and seemingly mundane practices undertaken within the home can and should be understood as entangled within broader social and political processes [63,64], as well as material and infrastructural conditions from the home to wider scales [65]. A focus on this everyday-ness provides a lens through which to understand the interconnection of scales [66] and the structural conditions contributing to the social reproduction of the everyday [67]. The home becomes the space where all these factors and processes collide [68] and shape practices that consume [7,18,68,69]. The use of home is necessary in order to develop deeper and nuanced conceptualisations, which will be essential for maximising policy effectiveness – both in terms of existing policy and developing new policy [6].

Within geography and environmental humanities, there is growing scholarship working to capture the complexity of what is happening within the home and everyday life around consumption [10,15,17,20], taking account of the complex social dynamics within which domestic consumption occurs [19,30,70]. Much work has demonstrated how practices within households that consume water and energy are part of the dynamics of everyday life, such as meanings, emotions, habits and routines [13,71–73]. Work on energy poverty and vulnerability has further connected water and energy consuming practices with health and wellbeing [42–44].

As scholarship critiquing techno-efficient approaches to domestic consumption, as well as developing more nuanced accounts of consumption within homes, has grown [19], there is an increasing demand to pay more attention to the governance of social life [19,70,74,75] and, in particular, "explore the ways in which policy is already embroiled, in explicit and implicit ways, in the constitution of demand" ([19], p2). Of particular importance to this work has been the development of the concept of 'non-energy policy' or 'invisible energy policy' [19,70,76,77]. These are policies that are not strictly formulated to impact upon energy systems, but still have an impact reflecting that they influence the governance of everyday life, and through this, exert an impact upon energy systems [19]. Within this research the concept of non-energy policy is expanded to non-resource policy, reflecting that it is likely if seemingly unrelated policies to energy impact upon levels of energy consumption and associated labour, it is very likely that there would be similar outcomes in terms of water consumption and the labour surrounding water consumption (particularly for those practices - like laundry, water treatment, dishwashing and cooking - that tend to consume both water and energy). Whilst the term policy is maintained, we also expand this theoretically to include ideology, recognising ideology as a political tool imposed upon a population and which, whilst not necessarily related to resource consumption and labour, could very much impact upon it through influencing the governance of social life [19,70,74,75]. Utilising the term non-resource policy recognises that resource demand is influenced by policy that is more than resource-focused, with research beginning to show how policies and campaigns from across different areas of governance have an impact upon energy demand [76,78], for example austerity [17,43,79], health [44], and economic policies to name some [76,78]. More broadly these policies are often embedded and coherent within the ideological regimes seeking to make populations more governable [17] and lead to the social reproduction of pre-existing societal inequalities [17,80]. However whilst the aforementioned scholarship is growing, in much work policies are commonly treated as context, rather than factors that are shaping demand and consumption within homes [76,78]. This means that "key gaps in understanding remain" ([19], p2) and particularly in terms of how non-resource policies are lived out within everyday life [19]. This is important as such policies then have a role in sustaining and increasing demand – as well as potentially in transforming it – and so need to be recognised within understandings of everyday practices that consume resources [19,70].

3. Exploring everyday consumption of water and energy within Shanghai homes

Research was undertaken within 35 participant homes in Shanghai. In this section recruitment processes are discussed, followed by data collection and analysis methods used to understand how energy and water consuming practices within the home are linked to non-resource policy.

Ethical approval was granted according to the University of [redacted for review] high risk protocol. The nature of high risk in this research was because of the research taking place 'within homes' and therefore deemed essential for risk planning with regards to the researcher and participant's safety. These safety issues were mitigated through taking a research assistant along to all meetings and establishing a system of check ins with supervisors. Prior informed consent was sought and received from all participants. Research data was managed according to the University of [redacted for review] data management and ethical requirements. To protect the anonymity of all research participants, all data provided was anonymised by removing direct and indirect identifiers, including specific locations, and all participants have been assigned a pseudonym.

3.1. Participant recruitment and participant homes

Research was conducted Spring-Summer 2018. The recruitment strategy was purposive and adaptive, in order to ensure diversity of participants [36,81]. Participant recruitment began utilising *guanxi* - reciprocal ties of mutual assistance [82,83], important in research in China [82,84]. The recruitment strategy had two stages. In stage 1 the first author's visa-sponsoring professor (Professor Su, pseudonym) used WeChat to circulate a recruitment call. Homes recruited in this manner were largely middle-class - lived in apartments purchased on the private housing market and occupied professions in medicine, academia, and business. In stage 2 snowball sampling was adopted [85] asking participants to help recruit through their own networks. Participants recruited tended to be working class - living in small, lower cost housing, either owned or rented, and working in lower paid professions such as administrative roles. All participant homes identified as familial or *jiaren*, in that they were related by either blood or marriage. Participant homes is used as the term to describe participants reflecting the entanglement of multigenerational family members with the social and physical infrastructures of homes. Characteristics of participant homes are outlined in Table 1. All 9 participant homes with three generations had children under the age of 18 living in them, and 12 out of the 13 two generation homes had children living within them.

3.2. Methods of data collection and analysis

Recognising everyday life is best captured through a toolbox of methods [86], research utilised home audits, consumption diaries and semi-structured interviews. Methods were staggered to support rapport

Table 1
Number of homes participating in the research, including details on class and number of generations living within homes.

Participant homes	Middle class	Working class	Total homes
1 generation	10	3	13
2 generations	8	5	13
3 generations	8	1	9
Total homes	**26**	**9**	**35**

development and enable busy families to participate more fully [17,43]. A research assistant was employed to support translation during interviews.

Home audits, a hybridisation of household audits [87] and home tours [88], were designed as the first research encounter and involved moving through homes with one or more family member, discussing points of water and energy consumption, such as appliances, and using these materialities to discuss related practices that involve consumption practices. During home audits participants would be provided with a water and energy consumption diary [79], giving space for participants to record what energy and/or water consuming practices were being undertaken within their home, as well as the responsibility, beneficiaries, temporality and materialities entangled with these practices. Whilst the hope was to conduct home interviews in which – if relevant - all adult family members would participate, so as to explore "nuances of everyday shared domesticities" ([36], p6), this was often not possible and women more commonly participated at all stages of the research.

At the end of the home audit and informed by methods to understand the practices and labours of energy poor households in the Global North [79], participants would be provided with a water and energy consumption diary. This diary was for seven days and provided space for participants to record what water and/or energy consuming practices were being undertaken within their home, as well as the responsibility, recipients, temporality and materialities entangled with these practices. Semi-structured qualitative interviews were conducted after water and energy consumption diaries were collected and analysed, enabling interviews to develop upon the data produced through home audits and diaries. Whilst there is doubt about the capability of talk to capture the unconscious detail of everyday life and practice [126], research suggests that it is possible in talk-based methodologies as long as the researcher is attentive to detail [127]. Interviews followed a loose structure tracing different water and/or energy consuming practices within the home including laundering, cooking, and dishwashing. Whilst the hope was to conduct home interviews in which all adult family members would participate, so as to explore "nuances of everyday shared domesticities" ([36], p. 6), this was often not possible and women more commonly participated at all stages of the research.

Data was analysed first to understand the performance of, and gendered responsibilities and temporalities for, four practices: water treatment, cooking, dishwashing and laundering. These four practices were identified as the subject of analysis as practices at the nexus of water and energy consumption within the home are often forms of care – of self and others [36,89], and so will often have substantive implications in terms of levels of labour required, as well as the potential gendered nature of labour. As this paper seeks to understand the influence of gendered ideologies upon consumption practices within the home, these four practices thus felt relevant and appropriate.

The analysis process involved categorising data from interviews and diaries, using a codebook that covered labour type, labourer, and frequency of labour. This analysis delineated labour responsibilities and frequency and time spent undertaking each respective chore in the participant homes. Qualitative data was then additionally analysed thematically [90], inductively identifying emergences of what Greene and Fahy [19] identify as 'traces of policy' within their work.

4. Gendered responsibilities and temporalities of water treatment, cooking, dishwashing and laundering

This section begins with a brief description of the four everyday practices studied and overall gendered responsibilities of labour across participant homes, followed by a more in-depth analysis of these responsibilities in terms of temporalities, reflecting upon both frequency and life-stage, of participation.

Water treatment was implemented daily across participant homes using a range of methods, from boiling water to using a combination of water treatment processes in combination with boiling water [91], in order to reduce perceived risks of urban water pollution. Cooking was a daily practice, generally undertaken within private kitchens. Dishwashing was a daily practice and one home had a dishwasher. Laundering across participant homes was a twice weekly to daily practice, depending upon season and preference, and most homes implemented both machine washing and hand washing of clothing. Washing machines in participant homes were a mixture of top loading and drum/front loader machines, with several drum machines having an integrated dryer.

Across participant homes, women were disproportionately responsible for water treatment, cooking, dishwashing and laundering (Table 2). Water treatment and laundering tended to have women-only labour. The exception were homes in which women were too unwell to participate in domestic chores. Cooking and dishwashing, on the other hand, whilst dominated by female labour within the 35 homes, demonstrated greater participation by male family members. Women's more frequent responsibility for these four practices is unsurprising considering women's broader domestic burden in China [92–95].

Research on domestic labour has documented the increasing popularity of paid for labour amongst China's growing middle-class [96,97] and is commonly considered as an emancipating process (for middle-class) women who are able to employ domestic help and become managers of domestic responsibilities instead of labourers within own homes [96,98]. However, whilst domestic workers were employed in seven homes in this research, such labour was predominantly centralised on house cleaning and tidying and did not mitigate labour in terms of these four practices considered in this paper.

As reflected in Table 1, of the 35 familial homes, 9 homes were three generational, with grandparents, parents, and child/ren under the age of 18. The dynamics of three generational homes fit with overall findings that women have a greater domestic responsibility, with men participating to higher degrees in cooking and dishwashing. In terms of women's greater responsibility for water treatment, cooking and dishwashing, it was grandmothers that had the bulk of responsibility (Table 2). This meant that, specifically in terms of these labours, economically active (employed) women in all 9 three generational homes had much greater mitigation of their domestic labour burden compared to other women in the research (Table 2). Laundering stands out as particularly gendered as unlike water treatment, cooking, and dishwashing, mothers alongside grandmothers generally remain responsible in the home for these tasks. Whilst this labour sharing supports economically active women, there is research showing that the intergenerational labour burden grandparents, and particularly grandmothers, face in their retirement is substantive and impacts upon quality of life [99,100].

Within homes with one generation of adults (that is, in two generational homes with children under 18 or a one generational home with no children), women commonly undertake sole responsibility for these labour practices whether they are employed or retired (Table 2), whilst men are not only less likely to be participating in the labours of these practices, but if they do have sole responsibility then this responsibility is much more common when they are retired. In general, when women labour for a shared practice they are still participating frequently, whether they are employed or retired. Men who are both employed and retired are better represented for undertaking labour for a shared practice compared to having sole responsibility and men are more likely to share cooking and dishwashing labours compared to water treatment and laundering.

5. Situating gendered responsibilities and temporalities within the permeable home

Within the following section we discuss how participants within the research perceived gendered labour for the four studied domestic practices, and analyse these discussions in terms of traces of policy, as outlined by Greene and Fahy [19].

Table 2
Gendered labour (M = Male, F=Female) for water treatment, cooking, dishwashing, and laundering across 35 familial participant homes (one, two, and three generation). Three generation data also distinguishes shared responsibility between mothers and grandmothers.

Practice	One generation			Two generations			Three generations					N/A	No data	Total homes
	M	F	Shared (M/F)	M	F	Shared (M/F)	M	F			Shared (M/F)			
								Mother	Grandmother	Mother & grandmother				
Water treatment	3	8	0	1	11	0	2	1	6	0	0	2	1	35
Cooking	3	6	2	1	8	2	2	0	4	1	2	3	1	35
Dishwashing	3	7	1	0	9	2	3	1	2	0	2	3	2	35
Laundering	1	9	3	0	11	1	0	0	0	7	1	0	2	35

5.1. Domestic work is (still) women's work

When discussing gendered labour and women's dominant responsibility for the four labours discussed, women were aware of and willing to discuss their greater responsibility for domestic labour, often with broad acknowledgements of "this is how China is" (Sherry, Female, 2 generations) and "this is the way it is in most homes" (Jinlian, Female, 2 generations). That "women do more of the housework and they also look after the children" (Sherry) was most commonly attributed to gendered divisions of space; a "Chinese concept" that "men are responsible for the outside work and women are responsible for indoor work" (Chali, Female, 2 generations). This spatial attribution was irrespective of the fact that women identifying it were also often employed outside of the home.

The stark alignment of these gendered roles with *nei (inside)* and *wai (outside)* [55–57], as introduced in Section 2.2, is perhaps surprising considering that women's liberation was a critical component of Maoist political ideology – 'women can hold up half the sky' [101]. However, the gender revolution stopped short of the home and family, in China as well as more broadly, and traditional gendered division of labour remained unchanged for many women [59,61,101]. It is important to recognise the recent resurgence of traditional Confucian family values and gendered roles within the Chinese Communist Party (CCP) and government discourse which commonly centralises a virtuous, obedient wife who is responsible for the domestic space [61]. In China's post-1978 reforms and drive for market efficiency, care practices and provisioning services that consume water and energy were devolved from the *danwei* or work unit to the household [102–104]. Reflecting market deregulation worldwide, China's reforms are predicated upon the labour of women [61,105] with traditional Confucian gendered ideologies of women's role within the home reflected in CCP and government discourse and propaganda post-1978 [61,106,107]. Explicit reference to such values can now commonly be observed within speeches made by contemporary leaders, including Xi Jinping [61,108,109]. The All-China Women's Federation (ACWF) also, despite being established to protect and promote the rights and interests of women, actively reinforce traditional family and gendered values through their organisation [61,110]. For example they have recently been involved in establishing New Era Women's Schools which prepare women for employability but also for their domestic roles within the home and family [108]. These gendered ideologies contrast strongly with the United Nation's Sustainable Development Goal number 5 of gender equality, which states that "gender equality is a fundamental human right and a necessary foundation for a peaceful, prosperous and sustainable world" ([111], p22). When discussing their greater responsibility for domestic work, women commonly identified their lower incomes, compared to men, as a contributing factor. Sherry who had worked in Human Resources for 20 years, observed that "if men and women are in the same position [at work], women will still earn less than men". She identified this is as resulting from the recruitment of women undertaken with the expectation of flexibility and shorter working days for them to care for children and elderly relatives. Lower wages were justified as such care was perceived to "affect women's work efficiency, enthusiasm and amount of time they work". Such discrimination is also found in a recent review of national civil service job lists in China by Human Rights Watch [112] which found that 19 % of job postings in 2018 specified the position was men-only or suitable for men.

As men are considered to have a greater earning potential outside of the home, more conscious factoring is undertaken by women to utilise their caring practices within the home to support their partners. According to Ling (Female, 2 generations):

> Because the income of most women is not as high as their husband, and as a family you have to get enough income and if your husband doesn't work enough it's a big problem, so, you have to decide to help him to work better [through housework] and get a higher income.

These reflections by women demonstrate that it is not just about the (active) proliferation of gendered responsibilisation of domestic space, but also how the gendered ideologies in the labour market and domestic labour are co-constitutive. Sherry and Ling both reflected upon systems that create conditions in which it 'makes sense' for women to undertake disproportionate domestic responsibility as they are consistently recruited into lower paid positions that have the space for this responsibility already entrenched.

5.2. Hygiene work/health protection is women's work

A further observation in the participation of men within domestic work across familial homes was that their participation commonly favours cooking and dishwashing, whilst women's labour was disproportionate across all practices but much more so for water treatment and laundering (Table 2). This division is interesting considering a strong division in the importance of hygiene between these practices was also observed. For whilst hygiene and cleanliness for all four practices was important for the participants, it was considered particularly critical for water treatment and laundering.

For both water treatment and laundering greater levels of, and closer attention to, hygiene and cleanliness were considered essential for maintaining a healthy body and to avoid associated medical costs of an unhealthy body. In contrast, cleanliness and hygiene did not emerge as particularly strong or emotive concerns for cooking or dishwashing across participant homes. For example, dish sanitisers were a present in 6 homes but infrequently used, considered an unnecessary dishwashing stage. Their presence in kitchens was the outcome of fashionable and aspirational kitchen design rather than considerations of hygiene, with one participant noting that sanitisers gave the 'western look' of an oven underneath the hob (Lee, male, 1 generation). Andi (Female, 3 generations) even used the idiom "*Bu gan, bu jing, chi le, mei bing*"- reflecting the notion that a little bit of dirt is good for you – in relation to cooking and dishwashing; a concept distinctly absent within any discussions on water treatment or laundering. Participants noted health concerns around food hygiene these were not played out within the kitchen itself but linked to well documented food contamination events [113], and mitigated by

purchasing food from trusted sources [114].

For water treatment, multiple stages of treatment, distrust of community-level treatment facilities and preference of boiling water in pans rather than electric kettles (due to being able to achieve higher water temperatures) were considered important to feel "psychologically good" (Coco, Female, 2 generations) about the condition of the water. Consumption of untreated or insufficiently treated water over an extended period was considered "chronic suicide" (Mrs Wu Senior, Female, 2 generations). In terms of laundering, several practices including separating different family members' clothes, not storing clothes before washing, separating different items of clothing and hand washing underwear and socks also separately from one another were implemented in order to maintain hygiene. Alternatives to such practices were commonly met with looks of disgust by participants, and comments such as "*bu ganjing bu ganjing* - not clean not clean".

When discussing women's greater participation in the four practices, women themselves often emphasised their greater capacity for ensuring that practices would achieve acceptable standards within the home for cleanliness and hygiene. "Women are more diligent" (Chali) and "Women will pay special attention to cleanliness" (Xiaoli, Female, 3 generations). This special attention was perceived as particularly pertinent with reference to the laundering of clothes. "Women are much more attentive to the cleanliness of clothes" (Mrs Huang, 3 generations), "men are not very good at washing clothes" (Mrs Huang), and "if men did [wash clothes] they wouldn't do it properly. They wouldn't be clean or hygienic" (Mrs Li, 2 generations).

Understandings of gender in China are still largely constructed through invocation of 'biological facts', and considerations of innate roles and abilities. As such they are embedded within the traditional gendered constructions of Confucian patriarchy and gendered roles [115,116] and are thus related to the aforementioned desocialisation of care and necessity of the women to take over the role of the state and the invoking of gendered norms as part of the process to achieve this.

5.3. Health protection and the production of the high-quality child

When discussing everyday practices within the home as health protection, the importance of this was particularly stark in participant homes with children. "We have children, so we need to focus on health!" (Coco) was a common message to hear from parents during research and as Sherry noted "…nowadays every family is concerned that children can grow up healthily, without health problems." According to Ling, health is "the most important thing; it's foundational" - it is the building block upon which children develop and achieve; you need to be healthy to attend school and to learn well. This was considered particularly critical within Shanghai where the school system is considered so competitive (Ling, Sherry, Viv and Fang). Such an awareness of ever-growing demands on what is needed for young people to succeed in China is also found in work by Liu [117] and Kuan [62].

The importance of children's health emerged particularly strongly within practices of laundering within the home, compared to other practices. Laundering practices, in homes with children, were undertaken in ways that were framed as specifically protecting children's health by preventing contamination of their clothes. These included separating adults' and children's clothes when undertaking laundering, cleaning the washing machine between laundering adults and children's clothes, laundering children's clothes by hand, and purchasing a second washing machine to wash children's clothes. The purchasing of a second washing machine specifically for washing children's clothes is considered "the best scenario" (Ling) but limited by space.

Within China's transition towards a knowledge-based, high-technology economy, discourses around the necessity of 'high-quality' citizens, often centralises around the perception that such transition and subsequent future national growth depend upon the production of the next generation of healthy and intelligent children [108,118–120]. This is a very different citizen than was needed in the previous socialist production economy with a surplus of relatively low-skilled labour [62,120]. According to the CCP (2000 in ([120], p595) "children's psychological and physical health constitutes a 'precondition' and 'a manifestation of the strong vitality of the Chinese nation'".

However what also emerged in discussions with women was that the centralisation of children's health within these everyday labours was not only due to their children's health being considered integral to the country's economic transition, but also linked with profound anxieties around children's health linked to China's neoliberal reforms, lax government regulation of industry, and absence of a regulatory environment for such industry that "render today's childcare practices risk-ridden" ([114], p6–7). Participants reflected distrust in items such as baby products, including milk powder, medicines and vaccines (Andi, Sherry), as well as the broader publication of risks on television and online (Mr Long).

As indicated in previous research, such anxieties about children's health emerge from a considerable number of health and safety scandals that have disproportionately affected babies, infants and children, including melamine in infant formula [114], the child death rate in the 2008 Sichuan Earthquake due to poor quality school buildings [121], and the 2018 fake vaccines scandal [122]. The occurrence of these risks and the absence of a protective regulatory environment due to the party-state means that parents and carers must manage (perceived) risks of increasing threats to public health [114]. Such management is often through the enactment of everyday practices of management and control [121,123].

The responsibility of ensuring the health of children, and therefore also attributing responsibility for the associated labours, has also been directly attributed as the responsibility of women by the CCP. According to Xi Jinping (2013):

> "Attention should be paid to make full use of women's unique role in inheriting traditional virtues and cultivating good family culture. It affects domestic and social harmony as well as the healthy growth of the next generation".

As the labour of these everyday practices through which this risk is managed are already gendered, the intersection of the women's responsibility for the production of the healthy child and the necessity of hygiene and cleanliness within practices to protect health, as discussed further compounds, legitimises and exacerbates women's labour within the home.

6. Conclusion

Through ethnographic research in 35 familial homes in Shanghai, we have sought to move beyond the black-boxed household produced within Ecological Civilisation policy, and instead move into 'home', recognising home as a permeable and complex space where multiple processes and factors collide and shape everyday life and practices that consume water and energy resources. Through developing deeper and more nuanced understandings of everyday practices of consumptions within homes, we have demonstrated how the responsibilities and temporalities of labour for these practices as well as how these practices are entangled with "priorities and objectives across diverse policy arenas" ([19], p2). In doing so this paper demonstrated how women have a much greater responsibility for water treatment, cooking, dish-washing, and laundering in Shanghai homes. Further, through discussing practices with participants and analysing discussions for traces of policy and propaganda, this research has also demonstrated how gendered labours and responsibilities are entangled with much broader state ideologies (non-resource policies) around home, work, gender, family, employment and economic growth. The responsibilisation of women for everyday practices within the home that consume water and energy reflects the coherences of lived practices of consumption with ideological regimes seeking to make populations more governable [17].

Considering the assertion by Greene and Fahy [19], (p3) that

research at "the intersection of policy and practice through a lived experience perspective has the potential to generate new policy-relevant insights", it is important to consider the implications of the findings of this paper for sustainability interventions. One the one hand this paper demonstrates the importance of in-home research to understand the dynamics of everyday practices in consumption in the home and enable the design and targeting of interventions, accordingly, considering histories of sustainability and environmental interventions exacerbating women's labour, and supporting hyper-consumption in middle-income homes. On the other hand, what this research also demonstrates is how current gendered practices within the home are constituted as both a target of sustainability interventions as well as being a central part of the China's current growth model and the ideological regimes that enable this. If everyday practices and escalating consumption, as identified within laundering for example and which are further developed in [removed for review] are so entangled with these regimes, it then becomes difficult to see how any meaningful intervention would be implemented at national or even local governance levels, as this would mean undermining ideological regimes of population governance and economic growth – namely ecological civilisation.

Within this paper we have made several distinctive contributions vis-à-vis related work on everyday consumption practices in the home. First, it illuminates the specific circumstances that underpin these practices in relation to energy and water within homes in Shanghai; this is, as we note in the introduction, 'important for challenging the homogenous household prominent in ecological civilisation policy within China'. Second, as we have just highlighted we have underlined the 'temporalities of labour for these practices', as well their entanglement with non-resource policies across diverse arenas. Third, throughout the paper we uncover how everyday practices are inherently connected to 'the permeability of the home, both within China as well as more broadly'. While there are policy contradictions and policy paradoxes highlighted in addressing the 'non-resource policy' influences that shape water and energy practice labours in our home, we hope that contributes to a burgeoning literature on everyday life and resource consumption (redacted for review) that may provide some nuance to current and future environmental and social policy efforts despite the complex context of broader policy regimes.

Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Harriet Larrington-Spencer reports financial support was provided by Unilever Plc.

Data availability

Data will be made available on request.

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