The Aftermath of Minds, Hearts, and Symbols: A Multidimensional Perspective on Digital Housework

Alina Silion
Doctoral School of Sociology, University of Bucharest

Abstract: Digital housework is one of the outcomes of the spread of interactive, smart technologies in the home. This new type of work consists of domestic, personal, and professional activities that are carried out at home using technological and digital devices. This study seeks to provide a better understanding of the gender implications of the cognitive, emotional, symbolic, and outcome dimensions of digital housework. The research questions used in the study are: (1) What are cognitive, emotional, and symbolic digital housework tasks and their outcomes? (2) What gender patterns can be observed in the performance of cognitive, emotional, and symbolic digital housework? The results are drawn from a thematic analysis of 53 cultural biographies of domestic devices and indicate a distinction between cognitive, emotion, and symbolic digital housework tasks that lead to digital housework outcomes in the form of digital capital. The gender aspects of all the dimensions of digital housework are discussed along with the theoretical and practical implications of the study's findings.
Keywords: digital housework, gender, digital capital

Silion, Alina. 2024. The Aftermath of Minds, Hearts and Symbols: A Multidimensional Perspective on Digital Housework. *Gender a výzkum / Gender and Research* 25 (2): 13–41, https://doi.org/10.13060/gav.2024.015.

Today, the domestic realm is saturated with devices, appliances, and digital systems (Lupton, Pink, Horst 2021). Also, domestic work is dynamic and continuously transforming through technological development. Moreover, the way people live and work in their households is of interest because of the transformations caused by the diversification and increased time spent on activities carried out inside the home since the pandemic. In other words, macro-social events have penetrated and are influencing the private domestic life of individuals. Therefore, the new way of living in tech-

nologised domestic spaces requires sociological attention. Furthermore, the gender dimension of technologised domestic activities needs further understanding. These aspects can be captured and illustrated through the practice of digital housework.

To grasp digital housework, this paper provides a theoretical background of the concept and proposes four new dimensions that are relevant when analysing digital housework: the cognitive, emotional, symbolic, and outcome dimension. The research questions are: What are cognitive, emotional, and symbolic digital housework tasks and their outcomes, and what are the gender patterns of performing cognitive, emotional, and symbolic digital housework? By answering these questions, the pervasive practice of digital housework is outlined in order to raise awareness regarding its implications for household members and other stakeholders. Thus, the aims of this paper are to provide a complex conceptualisation of digital housework and address some sociological implications regarding gender roles and dynamics in the household through the performance of cognitive, emotional, and symbolic digital housework and its outcomes.

Theoretical background: What is digital housework?

In the sociological literature, digital housework is defined as: the work of installing and maintaining the digital network in the domestic space (Tolmie et al. 2007), the work of maintaining the online domain (Whiting et al. 2015), the activity of using ubiquitous technological devices in the home (Rode, Poole 2018), the support work for professional activities performed at home (Whiting, Symon 2020), and the work of managing digital data and information (Horst, Sinanan 2021). These definitions comprise multiple elements of digital housework and can be summarised as the work that is implied by the use of digital devices for all the activities undertaken in the house.

More specifically, digital housework represents the transformation of housework in response to the pervasion of technology in the domestic realm. Oakley (2018) described housework as monotonous, fragmentary, routine, continuous, and repetitive, and, by extension, the tasks performed with domestic technologies can be alike. If housework consists of household management tasks, such as grocery shopping, preparing meals, household cleaning, yard work, repairs, paying bills, and childcare tasks such as caring for children, transporting them, and helping them with homework (Schwanen, Kwan, Ren 2014), digital housework consists of those new tasks that directly involve domestic, personal, and professional digital devices used in homes. Since the literature does not provide a comprehensive operationalisation of digital housework, Table 1 presents three identified classifications and several indicative examples of such tasks. Based on the literature, this article ultimately proposes eight

digital housework tasks: technology acquisition, technology installation, digital literacy, technological customisation, technology updates, digital devices and systems automation, technology maintenance, and technology repair.

Table 1: The operationalisation of digital housework according to the literature

Dimensions	Types of tasks	Example of tasks	Example of dimension overlapping
Temporal (Whiting et al. 2015)	Frequent	Cleaning devices	Surface cleaning of devices
	Seldom	Repairing devices	Deep cleaning of devices
Typological (Kennedy et al. 2015)	Physical	Charging devices	Physical cleaning of devices
	Virtual	Syncing digital devices	Virtual cleaning of devices
Teleological (Whiting, Symon 2020)	Functional	Installing devices	Functional cleaning of devices
	Aesthetic	Personalising devices	Aesthetic cleaning of devices

Source: Author.

Digital housework is strongly related to traditional housework because it involves (1) the digital transformation of original housework tasks and (2) the addition of digital tasks to traditional housework. In concrete terms digital housework consists of tasks where household members (1) modify the ways of using digital appliances for housework (e.g. programming a vacuum cleaner robot instead of doing the task manually) and (2) perform previously inexistent tasks for domestic technologies (updating, customizing, maintaining, etc.). Thus, digital housework is a natural continuation of housework determined by the technological advances in home appliances. In this context it is important to mention the division of digital housework as a topic that needs to be explored, since, to the author's knowledge, no quantitative data yet exist on the gender and generational division of digital housework.

Nevertheless, based on a qualitative study, digital housework, unlike traditional housework, is performed mostly by men (Kennedy et al. 2015). According to Kennedy et al. (2015), the explanation for this resides in the projection of this type of work as a personal interest. Furthermore, since technology is associated with masculinity, the performance of digital housework tasks is a form of power expression in relation to the female partner and other household members (Rode, Poole 2018). In addition, men who undertake digital housework consider women's preferences and abilities regarding technological devices and exhibit digital chivalry (Aagaard 2023). In other words, digital housework shifts who does some tasks in the household but reinforces gender roles. For example, Martin (2022) discusses how by performing energy housekeeping (a form of housework that implies energy consumption management through digital technologies), men strengthen their position of authority in relation

to the woman partner. Considering these results, digital housework entails transformations in the gender domain that need to be further analysed.

Finally, digital housework has four work characteristics that are relevant for the scope of this paper. Firstly, digital housework has a cognitive dimension involving tasks like planning, programming, learning, and so forth (Aagaard 2023). Secondly, digital housework has an affective dimension, which consists of encouraging an emotional attachment to technology (Horst, Sinanan 2021). Thirdly, digital housework has a symbolic dimension, determined by the role of expertise in the house (Kennedy et al. 2015) and by the co-construction of identity (Rode, Poole 2018). Lastly, digital housework has a dimension to it that relates to outcome in the form of the ability to work from home (Whiting, Symon 2020). These characteristics of digital housework, as being cognitive, affective, symbolic, and an outcome, are the basis for the dimensions of it that are analysed in this paper from a gender perspective. Therefore, theoretical background for these four dimensions of digital housework is provided forwards.

The cognitive dimension of digital housework

The physical side and the cognitive side of digital housework interact and cannot exist in isolation (Mehta, Parasuraman 2013). The cognitive dimension of housework is defined in this paper as the mental tasks that are performed for the purpose of using technology in the domestic environment. Reviewing the literature on cognitive work, we can distil the specific nature of cognitive digital housework. For example, cognitive labour is: invisible for both the person doing it and for other household members; overlooked because of it is immaterial in nature and diffuse and abstract in terms of time-boundedness, control, flexibility, etc. (Daminger 2019). These three characteristics apply to digital housework (Whiting, Symon 2020; Whiting et al. 2015; Tolmie et al. 2007). Therefore, the cognitive dimension of digital housework renders it invisible, overlooked, and diffuse.

Regarding the content of cognitive housework, Daminger (2019) identifies four tasks: the anticipation of needs, problems, or opportunities; the identification of options; choosing between options; and monitoring the processes of addressing needs and executing decisions. These tasks can be performed in both the housework or digital housework domains. While this paper focuses on digital housework, two somehow overlapping but distinctive domains of digital housework are presented below.

Firstly, cognitive tasks can be performed in the physical domain of digital housework. A concrete example given by Aagaard (2023) is the programming of a vacuum cleaner robot through tasks like: identifying and deciding the robot's best route and program to avoid obstacles and monitoring its performance in the house. Secondly, another domain that implies cognitive digital housework is the virtual domain. On

this line, household members express virtual intelligence by: recognising, directing, and maintaining the virtual realm (Makarius, Larson 2017). In other words, the virtual component of digital housework creates an opportunity to perform cognitive tasks by adding a virtual space that needs to be managed. For example, Kennedy et al. (2015) identify the need to plan in advance to download digital content owing to an intermittent connection or the need to sort and organise digital content.

Therefore, using the cognitive attribute proposed by Layer et al. (2009) the intersection of the domains of cognitive tasks and digital housework can produce some specific cognitive digital housework tasks in the following forms: accurately perceiving the characteristics of technologies; processing the stage and condition of devices; acting in a proper and efficient manner regarding the technological needs; checking and retrieving devices; selecting the type and adjusting technology; transmitting technological knowledge in the house; and planning a technological intervention or acquisition. Every example of a cognitive task mentioned here can be assigned to one of the four cognitive tasks proposed by Daminger (2019). Therefore, the cognitive housework tasks proposed by Daminger (2019) can be used to identify the cognitive dimension of digital housework.

Also, the cognitive nature of digital housework can reside in the mental processes and operations that are required to perform it. These operations are: cognitive shifts, interruptions, and workload management (Potter et al. 2005). Cognitive shifts can occur when performing a digital housework task. For example, in the process of repairing a device, attention shifts from the device to the tutorial and back. Also, regarding the use of technology in the house and interruptions to a given activity, two scenarios are possible. The first one is represented by an interruption in the performance of a digital housework task – for example, a phone ringing while a new kitchen robot is being installed. The other one sees digital housework tasks as an interruption in the ordinary use of domestic technologies. In this case, tasks such as updating, learning, repairing, and so on are the interruptions that need to be managed. Therefore, the cognitive work of managing shifts and interruptions is an integral part of digital housework.

Moreover, mental workload management is relevant in the context of performing digital housework tasks that necessitate attention. A domestic technology may not require attention if it is automatised. However, Mehta and Parasuraman (2013) argue that automation can increase the mental workload because of the need to monitor the automatised process. Therefore, digital housework may entail mental work through the task of monitoring digital domestic devices and systems. Therefore, when at least one digital housework task needs to be done, a cognitive stacking load is formed. Considering the existence of multiple devices in the households, this cognitive stacking load can be easily formed and household members have to manage the tasks accordingly. Yet, vigilance and mental fatigue can be managed with tech-

nological cues such as notifications, sound or visual signals, maintenance panels, and a flexible distribution of tasks between the human and the technology. Considering both the requirements and the contributions of technology in the house, the cognitive side of digital housework needs to be carefully defined.

Finally, cognitive housework, is gendered in type and distribution (Daminger 2019). Regarding the gender-typed domains of cognitive housework (logistics, caring for children, social relationships, cleaning, shopping, food, leisure, finances, home and car maintenance), Daminger (2019) finds a difference in focus: the first six are female-led domains and the last three domains are shared. These findings reflect the domains of physical housework that are typically handled by women (Daminger 2019). For example, caring for children and cleaning are women's domains in the case of both physical and cognitive housework, while logistics and social relationships are found are found to be women-led only in the case of cognitive housework. For the distribution of cognitive housework tasks, Daminger (2019) presents anticipation and monitoring tasks as female-led and identification and decision tasks as shared between partners. This distribution of cognitive housework tasks illustrates a disproportionality regarding the cognitive load of housework. Considering these findings and the specific nature of digital housework in terms of the gender dimension (Kennedy et al. 2015), it is important to establish what the gender patterns of cognitive digital housework are.

Emotion work

Emotion work can be performed in a tech work environment or in a smart house (Beare et al. 2020). Emotion work is defined as the effort to modify a feeling through acts of evoking or suppressing it (Hochschild 1979), the psychological process involved in emotional management (Zapf 2002), and the individual behaviours that influence in a favourable way the affect and emotional condition of others (Strazdins 2000). Therefore, emotion work is performed to manage one's own or others' emotions (Hochschild 1979) and can be found in the organisation of digital housework in the household (Aagaard 2023). In this paper, the emotional dimension of digital housework is defined as the affective tasks that are performed for the use of technology in the domestic environment.

Emotion work is relevant in the technologised domestic environment due to the affective implications of digital devices. Beare et al. (2020) argue that emotional reactions to digital technology are determined by outcome beliefs (the emotional cost and benefit of using technology), motivators (emotions generated by using technology), personality-technology fit (similarity), and task-technology fit (stability). Also, technology creates an emotional attachment and emotional reluctance (Beare et al. 2020). In other words, people can become emotionally attached to technology and

can have counter-feelings regarding technology based on their beliefs, personal characteristics, the technology's features, and so on. These situations can lead to the performance of emotion digital housework when a person is trying to adhere to feeling rules. Feeling rules are the general principles that guide an evaluation of a feeling in a given situation (Hochschild 1979). These are determined by ideologies such as political feminism, progressivism, environmentalism, globalism, etc. An example of emotion work performed to respect feeling rules is: a household member loving the dishwasher because it is environmentally friendly.

Also, emotion work is mainly specific to work relating to people, such as the digital housework task of transmitting tech knowledge within the household, but it is also found, as a subtask, in object-related work (Zapf 2002), such as the digital housework tasks of installing, charging, updating, etc., devices. Therefore, according to Zapf (2002), emotion work has two dimensions: emotional dissonance and emotional effort. An example of emotional dissonance is evoking calmness when feeling threaten by technology surveillance, and an example of emotional effort is accepting domestic video surveillance through habituation. These are personal dimensions because they imply primarily a human-technology emotional interaction. During these interactions, the frequency, attentiveness, duration, intensity, and variety of emotional display is managed through emotional dissonance or emotional effort. Thus, the performance of emotion digital housework can require expressing, suppressing, and sensing emotions when interacting with domestic technologies.

Moreover, from Strazdins' perspective (2000), emotional work has three dimensions: companionship behaviours, help behaviours, and regulation behaviours. Companionship behaviours consist of the process of developing positive emotions through verbal affection and the effort to spend time together (e.g. personalising domestic devices). Help actions include the operation of reducing negative emotions by means of doing things that protect others form stress (e.g. repairing a domestic appliance). Regulation behaviours are represented by acts that determine the self-adjusting of negative and positive emotions through persuasion to stop harmful behaviours and to improve beneficial ones (e.g. transmitting technological knowledge to a household member in need). These emotional behaviours illustrate the social dimension of the emotional work required by digital housework.

Finally, from a gender perspective, a relevant characteristic of emotional work is that the type of work matters more than the personal traits of the individual doing it (Strazdins 2000). The roles that demand emotional work can be both professional (manager, mate, etc.) and familial (parent, spouse, etc.). In this context, another role that is significant in this paper and in 21st-century households is that of expert or person responsible for digital housework (Kennedy et al. 2015). A result from Strazdins' study (2000) is that emotion work is a requirement of the job more than it is a

gender function. Therefore, digital housework can require emotion work from the digital housework expert regardless of who (a man or a woman) is performing the role. Considering all these theoretical data, the specifics of emotion digital housework tasks are to be studied.

Symbolic work

In literature, social-symbolic work is defined as the deliberate endeavours of individuals to shape objects such as individuals and institutions (Shourkaei, Taylor, Dyck 2024), and as intentional efforts to change social arrangements (Geiger, Stendahl 2023). Symbolic work is multidimensional and integrates two types of work that are found explicitly in the digital housework literature: identity work (Rode, Poole 2018) and boundary work (Whiting, Symon 2020). In digital housework, the object of symbolic work may be the use of domestic technology and the social arrangements may involve the distribution of digital housework responsibilities. The symbolic nature of digital housework is therefore defined in this paper as the intentional shaping of tasks that are performed while using technology in the house.

Following the contribution of Shourkaei et al. (2024), symbolic work has three dimensions: a material dimension, a relational dimension, and a discursive dimension. These dimensions are relevant for understanding the concrete forms that symbolic digital housework can take. Firstly, material symbolic work consists of tasks that Shourkaei et al. (2024) classed as input, throughput, and output that have a symbolic aim. For example, material symbolic digital housework can include tasks like: procuring technology, installing devices, the alphabetisation (input), customisation, and actualisation of technology, the maintenance and repair of technological appliances (throughput), and tech automation (output). Secondly, relational symbolic digital housework can reside in a feedback loop between household members or between household members and online tech sites or technological brands. Thirdly, discursive symbolic digital housework can consist of informing and guiding other household members on the use of technology through language, narratives, and symbols (Geiger, Stendahl 2023). Therefore, in both human–human and human–technology domestic interactions, people perform material, relational, and discursive tasks in order to fashion their domestic environment and identities.

Moreover, from a temporal perspective, forms of symbolic work can be staked, aligned, and integrated (Geiger, Stendahl 2023). In other words, the three forms of symbolic digital housework discussed above can interact or be performed in isolation. These data address the quantity of symbolic work that can occur. Geiger and Stendahl (2023) examined the dimensions of symbolic work in relation to the pathways of work to identify six types of symbolic work: material breach work (DIY efforts), discur-

sive breach work (online community), material bridge work (co-innovating), relational bridge work (help request), values work (functioning based on a core value), and amplification work (sharing stories to reinforces community values). These symbolic dimensions and types of work are used to outline digital housework symbolic tasks.

From a gender perspective, Karakulak and Lawrence (2024) describe how two forms of symbolic work (relational and practice work) can shape the construction of gender inequality as a social problem in the context of social partnerships. Concretely, they found that building deep relations (between professional partners) worked to address the problem of gender inequality, while building efficient relationships did not. Likewise, deep practice work (education, role models, social practice disruption) helped to eliminate the barriers preventing women from participating in economic life, but shallow practice work (financial resources and trainings) did not affect these barriers. Therefore, symbolic work can exhibit nuances regarding gender construction and inequalities. Considering these findings, it is important to analyse the impact of performing symbolic digital housework on gender aspects.

The outcome dimension of work

Any work can have various material and immaterial outcomes. Some examples of outcomes from an organisational context are: attitudes, psychological well-being, physical health, motivation, performance, satisfaction, commitment, citizenship behaviour, etc. (Bond et al. 2004; Parker et al. 2003; Wang, Haggerty 2011). Among these, in the case of digital housework, motivation is an outcome that can result from a person gaining social recognition in the household and improving self-esteem through digital housework tasks (Kosfeld, Neckermann 2011). Satisfaction can be obtained by practising virtual intelligence skills like: establishing behavioural guidelines in interactions; coordinating information by using media according to the available tools and task-technology fit (Makarius, Larson 2017) during the performance of digital housework. Therefore, the outcome dimension of digital housework is defined in this paper as any positive results from the performance of digital housework.

However, the main concept that is considered relevant for digital housework outcomes is digital capital (Ragnedda 2018). Digital capital is defined as the set of digital skills and digital devices that a person collects and transfers form one sphere to another (Ragnedda 2018). Ragnedda (2018) argues that having a certain level of digital capital (abilities and resources) influences the usage of other forms of capital (social, political, economic, personal, and cultural) in the online realm, so that new perceivable outcomes occur in offline activities. Hence, a basic assumption is that by performing digital housework people enhance their digital capital. In other words, digital capital is an outcome of digital housework. However, in this paper the emphasis is not on

how digital capital is accumulated but rather on how the accumulation of digital capital through digital housework has a significant outcome for the household member performing digital housework.

Concretely, the interaction of digital capital with other forms of capital results in a set of benefits (Ragnedda 2018). Firstly, from a social viewpoint, digital housework can lead to capacities to connect with online and offline social networks and to transfer social capital and activism in the offline domestic realm. Secondly, from a political standpoint, but applied to the domestic domain, digital housework can increase people`s credibility and position within the household. Thirdly, from an economic perspective, through digital housework individuals can use resources to improve their class position or status and online information for resolving household tasks. Fourthly, regarding personal capital, digital housework supports individual's capacities to develop a creative lifestyle and self-esteem and deal with face-to-face interactions. Lastly, culturally speaking, digital housework improves household members' abilities to use, verify, absorb, and elaborate online information. These are some intuitive applications of digital capital interactions with the others forms of capital in the domestic environment. Therefore, digital capital can be used to identify the outcomes of digital housework.

Ultimately, regarding gender, the outcomes of work can differ by sex (Bond et al. 2004). Firstly, a study carried out by Elizur (1994) differentiates between cognitive (e.g. influence), affective (e.g. satisfaction), and instrumental (e.g. pay) work outcomes. The study's findings indicate that men and women ranked the outcomes slightly different. Nevertheless, Rosenbach et al. (1979) consider job dimensions (skill variety, task identity, task significance, autonomy, feedback, and dealing with others) to be the predictors for affective work outcomes (general job satisfaction and internal work motivation) for both men and women. Therefore, men's and women's perceptions of the dimensions of digital housework are important for discovering possible gender differences in the affective outcomes of digital housework. In addition, De Vuyst and Raeymaeckers (2019) identifies differences in the evaluation and accumulation of digital capital between men and women journalists. These differences include women owning undervalued digital capital and women being disadvantaged in the accumulation of digital capital. Considering these data, the gender implications of digital housework outcomes are of interest.

Methodology

The objective of this paper is to identify the gender implications of the proposed dimensions of digital housework. A qualitative methodology is used to achieve this because it is able to capture and analyse digital housework practices in detail. Thus,

two research questions are addressed: (1) What are the cognitive, emotional, and symbolic tasks of digital housework and their outcomes? (2) What are the gender patterns of performing cognitive, emotional, and symbolic digital housework? By answering these questions, the implications that digital housework has for domestic gender aspects like task distribution, roles, identities, and dynamics can be addressed.

To answer the research questions, 53 cultural biographies of digital domestic objects are thematically analysed. These social documents are gathered in a doctoral research project that conducted a sociological investigation based on semi-structured interviews. These interviews were conducted in 10 Romanian technologised households. A section of the interview focused on building cultural biographies for

Table 2: A list of devices described with cultural biographies according to their category of use

Domestic devices	Kitchen robot: Thermomix (2 biographies)
	Microwave oven
	Dishwasher
	Coffee machine
	Electric oven (2 biographies)
	Electric stove
	One Pot kitchen pot (2 biographies)
	Air fryer
	Kitchen robot: Ninja
	Refrigerator
	Classic vacuum cleaner
	Vertical vacuum cleaner (4 biographies)
	Vacuum cleaner robot (2 biographies)
Personal devices	Telephone (11 biographies)
	3D printer
	Laptop (3 biographies)
	Dyson hair dryer
	TV
	Radio
	PC
	Electric nail cutter and lamp
	Electric toothbrush
Professional devices	Laptop (12 biographies)

Source: Author.

the most used or recent domestic, personal, and professional digital devices. Thus, the instrument used to collect the data is designed to catch the transformations digital housework has brought about in domestic, personal, and professional life (see Appendix 1). However, the resulting cultural biographies of domestic devices offer a detailed narrative of technology use in the house and are used to identify the dimensions and outcomes of digital housework and their gender implications.

Constructing the cultural biographies of objects is a method that consists of using things to describe the social realm. Kopytoff (1986) suggests that people and objects construct themselves reciprocally in a world of commodities. Likewise, Dant (2001) argues that material objects are part of people's lives and that social lives impact objects. Objects can therefore reveal cultural aspects of the social world in how they acquire meaning through the way they are used (Dant 2001). Also, the anthropological method of constructing the cultural biographies of objects analyses the materiality of the social world by considering that objects have agency and lives (Hoskins 2006). From this perspective, domestic technologies, as ordinary objects, are the focus of the biographies in this paper and reveal changes in the everyday life of domestic practices and routines through their stories. Thus, the cultural biography of objects is the method used here to capture the social domestic practices that involve digital appliances.

Table 3: Sociodemographic data of the sample

Type of family relations	Married couple	Household 2, Household 9
	Married couple with children	Household 3, Household 6, Household 10
	Multigenerational family	Household 1, Household 4, Household 8
	Siblings	Household 5
	Live alone	Household 7
Status of employment	Employed*	Household 1, Household 2, Household 5, Household 6, Household 7, Household 9, Household 10
	Employed and maternity leave	Household 3
	Employed and retired	Household 4
	Employed and student	Household 8
Age structure	Young couples (27–36 years)	Household 2, Household 3, Household 6, Household 9, Household 10
	Young people (27–44 years)	Household 5, Household 7
	Multigenerational (18–65 years)	Household 1, Household 4, Household 8

*All the employed respondents work full time.
Source: Author.

Therefore, the biographies of domestic technologies were analysed using a set of categories, defined in reference to the literature. In other words, the analysis instrument (see Appendix 2) contains cognitive, emotional, symbolic, and outcome categories that are followed throughout the thematic analytic process. The cultural biographies analysed describe the domestic, personal, and professional digital devices that are used in the household and are thus the object of digital housework (see Table 2). Moreover, Table 3 provides a sociodemographic description of the households included in the study. The sample is a convenience sample accessed by the researcher through her personal network. However, the households are both smart houses (4) and technologised houses (6).

Findings

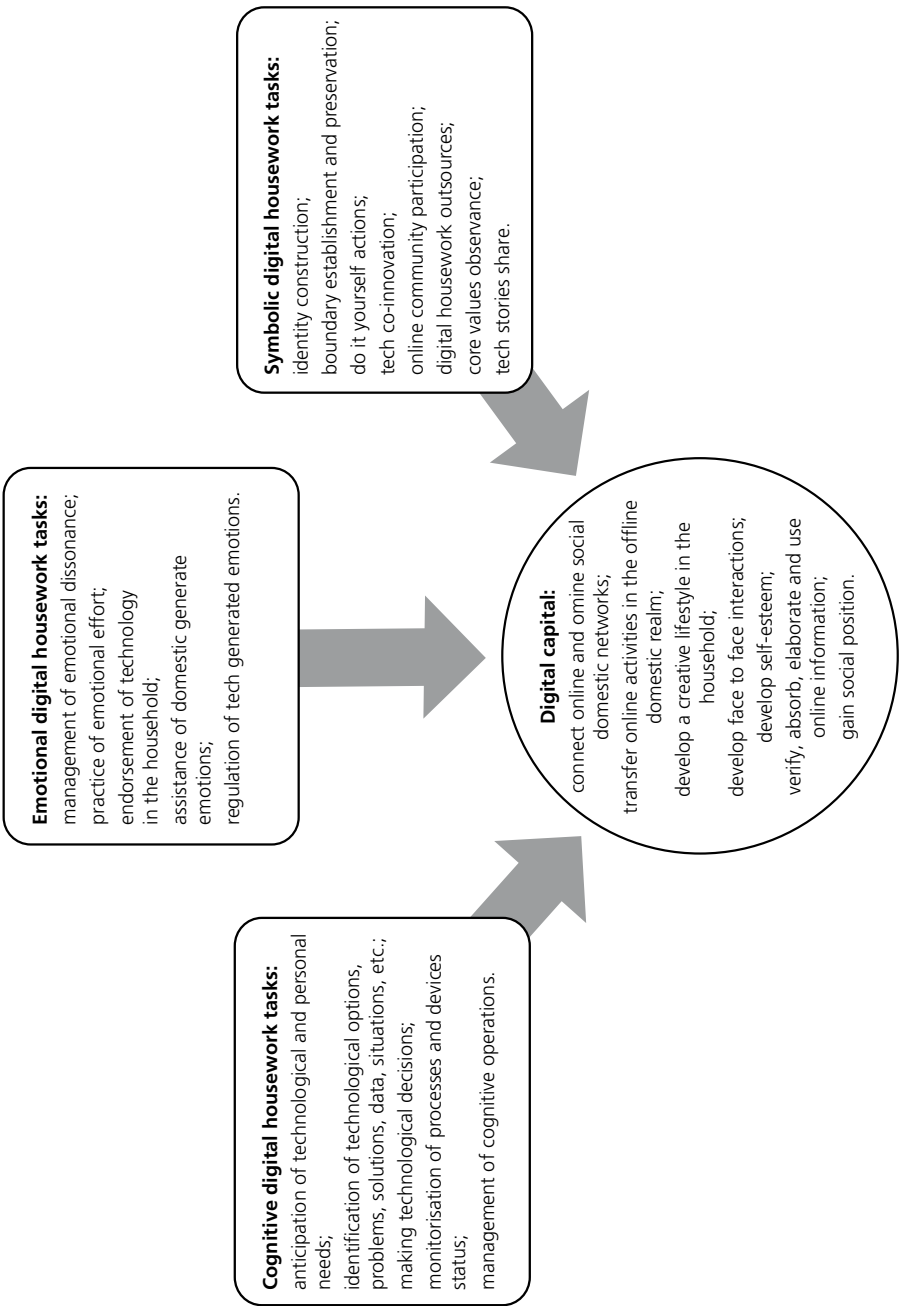
I analysed four dimensions of digital housework in order to draw out the multidimensional nature of digital housework. Beside the main tasks that form digital housework, I identified another three new categories of digital housework tasks and the outcomes of performing them. These digital housework tasks are cognitive, emotional, and symbolic and their outcomes are included in the construction of digital capital. Figure 1 summarises the answer to the first question of this study.

Cognitive digital housework

First and foremost, all digital housework tasks have a cognitive component. Whitin them, there is a purely cognitive digital housework task: gaining digital literacy. The process of digital literacy involves various cognitive operations but, rather than being treated as a self-standing cognitive digital housework task, digital literacy is considered a skill that transcends all cognitive digital housework tasks. The other main digital tasks have both a cognitive side and a physical one. From them, five generic cognitive digital tasks of digital housework are derived using the biographies of domestic devices, as explained below.

The anticipation of technological and personal needs involves acknowledging a personal need for new and specific technologies (e.g. a vacuum cleaner robot to vacuum the large amount of dust that accumulates in the house) and the need for domestic technologies to function properly while they are being used (e.g. positioning the fryer on the kitchen counter next to the hood to prevent the smell from spreading through the house) or while they are operating independently (e.g. creating space for the robot vacuum cleaner). The cognitive digital housework task of anticipating needs is accompanied by processes of planning tech acquisition and interventions.

Figure 1: Digital housework tasks and outcomes



Source: Author.

Identifying technological options, problems, solutions, situations, etc., is done by means of various operations: searching for technologies, perceiving them accurately through online promotional offers and online video materials, searching for and processing online reviews of certain devices, finding preferred settings (e.g. the preferred setting on an electric toothbrush), detecting problems through tech reparation tasks (e.g. finding a motherboard failure while trying to repair a laptop battery), and discovering the best solutions by means of trial and error: '*I searched through the settings until I found it. I tried a lot of things trying to see where the problem was coming from until I found it, more by accident*.' (female, age 18).

The cognitive digital housework task of making technological decisions includes: deciding whether to perform a certain task, where time and financial costs are the main factors considered; deciding when to perform it (e.g. frequently at the last minute); deciding where to place devices; deciding what digital devices to buy, use, learn, customise, automate, repair; and deciding how to carry out any given digital housework task. Therefore, digital housework has a strong decision-making component embedded in it.

The monitoring of processes and the state of devices is a task that especially appears in the process of tech acquisition, in the process of tech automation, and in the process of tech maintenance. It consists of the cognitive tasks of checking and processing prices and promotional offers at different moments in time; monitoring the actions and routines of automatised domestic technologies through small gestures of helping or avoiding digital devices; and monitoring the state and condition of the devices in order to change parts that do not work, add consumables, maintain their proper condition, etc. This cognitive housework task is constantly required and household technology regularly needs this kind of attention.

The management of cognitive shifts, cognitive workloads, cognitive fatigue, and interruptions is undertaken with or without the help of technology. Cognitive shifts appear when updating digital devices and are managed through update resistance or through digital literacy. Cognitive workloads are specific to tech maintenance and are neglected or managed with the help of technology (e.g. logistics apps and settings). Cognitive fatigue is managed through technology automation (e.g. smart plugs for remote control). Interruptions can occur when technology is in use and are managed through the digital housework task of tech maintenance, repair, learning, etc. Also, they can occur through notifications and sound signals when a digital housework task or something else is being done and are managed through multitasking or boundary setting.

Emotion digital housework

Like cognitive digital housework, emotion digital housework is woven into the fabric of digital housework. Firstly, the feeling rules that guide it, identified in the cultural biographies of domestic devices, are as follows: technology has two faces (feminist); technology is our friend (progressist); through technology we should help the environment (environmentalist); new is (always) better (globalist). Secondly, emotion digital housework is determined by: outcome beliefs, where the task of maintaining technology seems insignificant compared to the benefits of using it for housework; motivations, where the technology is seen as a time-saving option or where a person has a passion for technology and using it generates a sense of satisfaction; a personality-technology fit, where a person develops an emotional attachment to the technology; or a task-technology fit, where technology is used for domestic routines and can be replaced in order to better meet a domestic need.

Emotion digital housework incorporates both human–technology and human–human emotional management. Two emotion digital housework tasks performed in relation to domestic technologies are: emotional dissonance (e.g. expressing interest and excitement in the human–technology interaction) and emotional effort (e.g. expressing excitement instead of anxiety or discomfort regarding tech repair). Three emotion digital housework tasks performed in relation to another household member are: companionship, help, and regulation behaviours. In companionship behaviour, household members strengthen the feeling rules by expressing an appreciation for technology and by spending time and making an effort to perform and explain digital housework to others: '*I admit I let him look at it and see exactly how it works and then it's easier to explain [it] to me*.' (female, age 30). Help behaviour is the main emotional digital housework task because through digital literacy and the digital automation of devices others are protected from stress and personal relationships are improved. Regulation behaviour is rare but can be expressed through the digital housework task of acquiring technology and developing digital literacy.

Symbolic digital housework

In the cultural biographies of domestic devices eight symbolic digital housework tasks were identified (see Figure 1). They are exemplified further.

The identity of household members is constructed through the performance of digital housework in relation to family roles, gender roles (discussed separately), personal characteristics, and personal interests. Firstly, young adults establish their identity as technology users and specialists in the household and become providers of knowledge and help for their parents. Secondly, the personal inclination towards

expressing curiosity, seeking change, solving problems, and other technological interactions determines the construction of a digital houseworker's identity. Lastly, the individuals that invest in advanced domestic technologies form their identity around the experience of living in a smart house.

Boundary work is performed through digital housework in order to maintain the desired work–life balance (e.g. establishing a place for the professional devices), to limit the negative effect of technology upon personal health (e.g. buying a laptop with screen filters and protecters for the eyes), and to keep a healthy connection with other household members (e.g. designating a member who is responsible for digital housework). Furthermore, a common example of the task of boundary work is limiting the time spent on the usage of apps (by household members) through tech customisation.

Tech DIY actions include the following examples: creating a personalised light system in the house using sensors; using a Dyson extension in a personalised manner; repairing a vacuum cleaner cable with tape, etc. The co-innovation of digital domestic systems is performed more in collaboration with tech stores and suppliers by creating digital domestic configurations in the house using the technologies that are available on the market and accessible to the digital houseworker. The practice of co-innovation was not identified among household members while doing digital housework.

Online community participation is practised mainly while buying and learning about new devices by appealing to online resources such as '*Reviews of specific mom groups.*' (female, age 28). A common symbolic, relational digital housework task is the outsourcing of digital housework tasks. It is the reverse of DIY actions and consists of externalising mainly the installation and repair of domestic devices. Another aspect of outsourcing is the delegation of digital housework tasks within the household.

The observance of core values is performed through technology progress in the household, technology control, and early tech adoption. On the one hand, technology is considered a value. On the other hand, in relation to domestic technology use, value is placed on personalisation, adaptability, upsurge, curiosity, and the fulfilment of personal and technological needs. The symbolic digital housework task of sharing stories about personal technologies amplifies the effects of digital housework. It is performed both within households, through discursive practices, and between them, which leads to the spread of the use of digital domestic devices.

The outcomes of digital housework

The outcomes of digital housework can be efficiently synthesised in the concept of digital capital. In other words, the main and comprehensive outcome of digital housework is the accumulation of the digital capital of household members. The digital

capital formed through digital housework contains multiple digital housework outcomes that consist of improved digital abilities and social position.

By performing digital housework people can connect with online and offline social networks (e.g. combining social resources in the process of searching devices). Also, household members can transfer online activities (e.g. analysing video materials) to the offline realm (e.g. analysing domestic devices), especially through the cognitive digital tasks of identifying and managing information about technological repair. Another outcome is the development of a creative lifestyle, which is manifested in system tech installation and automation in the household. The development of face-to-face interactions is also an outcome of the symbolic digital housework task of outsourcing the repair of devices. Moreover, the symbolic digital housework tasks of tech DIY actions and identity construction can lead to the outcome of self-esteem development: '*I'm so proud of them, I liked the smart part, that's why I bought some sensors, some stuff.*' (male, age 33). In addition, digital alphabetisation can result in the improved abilities of verifying, absorbing, and using online information regarding domestic technology. Finally, another outcome of performing any digital housework task is the improvement of social position within the household and within society by gaining credibility and status based on tech expertise.

The gender dimension of digital housework

In this section the gender patterns of the digital housework dimensions discussed above are explored. Firstly, I analyse who performs cognitive, emotional, and symbolic digital housework tasks and how. Secondly, I identify the ways in which digital housework benefits both men and women. Table 4 presents the key findings regarding gender differences in the performance and outcomes of digital housework.

These findings show that cognitive digital housework is mostly performed by men, while women assist with the anticipation of personal needs, the identification of limited technological options and solutions, the monitoring of domestic devices, and multitasking in domestic life. Regarding emotional digital housework, women perform tasks in relation to technology through the management of emotional dissonance and emotional effort, while men seem to present less emotional tech dissonance and, thus, focus on the domestic endorsement of, assistance with, and regulation of tech-generated emotions for women. Symbolic digital housework tasks are both shared (identity construction, DIY actions, online community participation, and digital housework outsources) and specific to men (tech co-innovation, core value observance, and the sharing of tech stories) or to women (boundary establishment). Thus, through symbolic digital housework men and women build different identities (men – relational identity; women – individual identity) and domestic arrangements (men

Table 4: Key gendered digital housework findings

Digital housework dimension	Key findings regarding the MALE performance of digital housework	Key findings regarding the FEMALE performance of digital housework
Cognitive	Anticipate both personal and technological needs	Anticipate only personal needs
	Identify technological options, problems, solutions, etc.	Identify technological options, problems, solutions, etc. (only among women aged 18–34)
	Monitor devices and tech processes	Monitor devices and tech processes (if used personally for housework)
	Make decisions about technology	Trust men with making the decisions about technology
	Manage the cognitive operation for all the household members; manage cognitive shifts, workloads, fatigue, and interruptions by age	Manage interruptions through multitasking
Emotional	Perform human–human emotional management	Perform human–technology emotion management
	Gender feeling rule: Men like and understand technology	Gender feeling rule: Women need assistance in domestic technology use
	Express interest and excitement (in the case of younger men) and friendship (in the case of older men) about technology	Express confusion but contentment through the management of emotional dissonance
	Perform technological endorsement, assistance, and regulation in relation to women	Perform emotional effort
Symbolic	The constructing of an identity as tech experts, helpers, and providers	The construction of an identity as responsible, resourceful, and flexible domestic workers
	Co-innovate	Set boundaries
	Install complex DIY systems and configurations	Undertake simple DIY actions
	Outsource a few digital housework tasks: such as installation and repair	Outsource installation, alphabetisation, and repair to persons outside the house and delegate most of the digital housework tasks inside the house to others
	Participate in online communities especially for digital housework purposes	Participate less in online communities for digital housework purposes
	Observe core tech values and share tech stories	Not involved in symbolic discursive digital housework tasks

Outcome	Improve ability to transfer online activities to the domestic realm; improve ability to verify, absorb, elaborate, and use information; develop self-esteem and social position in the household	Develop ability to connect online and offline in social domestic networks, engage in a domestic lifestyle and in face-to-face interactions

Source: Author.

– systems construction, women – tech use personalisation); they also participate in online communities and outsource digital housework in distinct ways (men participate more and outsource less while women participate less and outsource more). These observations of shared symbolic tasks reveal that men focus on technological development and valorisation while women focus on technological preservation and limitation.

The outcomes of digital housework impact men and women differently depending on the specificity of the cognitive, emotional, or symbolic digital housework task performed. In other words, men and women can perform (1) different cognitive, emotional, and symbolic digital housework tasks or (2) the same cognitive, emotional, and symbolic digital housework tasks but do so differently, according to their genders. This has a direct impact on the personal outcomes of the digital housework performed. Therefore, as indicated in Table 4, men and women benefit differently from the outcomes of digital housework.

Discussion and conclusion

Understanding the implications of digital housework for gender sheds light on the transformations brought about by the penetration of technology into the domestic sphere. Also, considering the qualitative nature of this study, these implications need to be further explored. These findings, however, have implications for sociological knowledge regarding housework, digital housework, and gender.

First and foremost, given that housework includes digital housework, it is possible to draw one implication, which addresses a new characteristic. Housework has already been perceived as having an emotional dimension (Oakley 2018) and a cognitive dimension (Daminger 2019). Concretely, the symbolic nature of digital housework adds a new perspective on housework for the household members and contributes to the dynamics of task distribution. The result is that men take charge of the performance of digital housework (in accordance with findings from the literature, confirmed in this study by the quantity of tasks undertaken by men). Therefore, men are more involved in housework through digital housework. The extent to which they take over housework responsibilities has yet to be explored, but the findings of this study confirm

men's involvement in digital housework at a higher level than women's. Therefore, with the diversification of housework tasks determined by technology, men participate in housework undertake only through the tasks of digital housework, but they do not get involved in the other traditional housework tasks. In other words, men take on work that has symbolic significance. The implication of this preference is that men become more involved in the domestic realm as long as they can construct an identity, endorse technology use in the household, make technological decisions, and so on.

More precisely, digital housework does not replace traditional housework; it only transforms it by changing the type of tasks performed in order to clean, cook, wash, and so on and by adding new additional tasks on top the original housework tasks. Therefore, even if some housework tasks are automatised and the quantity of housework performed by women may decrease, this is offset by the new digital housework tasks that need to be undertaken. Women tend not to be the digital housekeeper of the home, but they involuntarily perform various types of digital housework tasks on a daily basis. So, the second implication that can be drawn by considering digital housework an independent domain is that it creates new gender role transfers within households. In this study, women were found to have a more individualistic approach to digital housework while men tended to take over the social role in the household by getting involved in relational emotional digital housework and creating relational identities. This implies a role transfer regarding social interactions in the household, where men have a double responsibility: the management of devices and the management of interactions between devices and household members (women).

Another gender implication is determined by the fact that housework benefits the entire household while digital housework directly benefits the person who performs it. In addition, while housework is considered a burden that rests on women shoulders, digital housework is not perceived as burden, so even if it is largely men's responsibility, it does not have the same attributes. Considering these differences between housework and digital housework, gender plays a double role. Firstly, while men tend to get involved in digital housework, they are the ones who quantitatively benefit more from it without feeling it to be a burden. Secondly, the fact that gender shapes how men and women perform digital housework, as the study findings indicate, implies that the outcomes differ accordingly. Therefore, the difference in the performance of the same digital housework leads to differences in the quality of the benefits men and women get from it. Digital housework benefits men's abilities, self-perception, and status in the household and women's domestic lifestyle and social interactions. Therefore, there is a gendered double standard regarding the performance of digital housework.

Lastly, given that the performance of digital housework is gendered, the outcome of undertaking this type of work – digital capital – is also gendered. The implication

of gendered digital domestic capital, which is the accumulation of personal benefits by performing digital housework, is that digital housework fosters gendered digital inequalities. In other words, since digital capital contributes to digital inequalities (Ragnedda, Ruiu 2020), gendered digital capital generates disparities between men's and women's skills, resources, and personal benefits. This study highlights how the formation of gender-specific digital capital can lead to inequalities by creating a vicious but advantageous circle between the performance of digital housework and the formation of digital capital for men and a vicious but necessary circle between household management and social interactions for women. The nuance that the study of digital capital as an outcome of digital housework highlights is the need to consider the digital divide within households, as microunits of society, in order to address gender inequalities. Therefore, gendered digital capital is especially relevant in the contemporary digitalised world.

In conclusion, digital housework is a multidimensional concept that can by grasped through a detailed analysis focusing on cognitive, emotional, symbolic, and outcome dimensions. Using 53 cultural biographies of domestic devices this study revealed that, as well as the concrete digital housework tasks performed in order to use appliances, it is also necessary to perform cognitive, emotional, and symbolic digital housework tasks. The performance of digital housework tasks results in a series of outcomes that are concretised in digital capital construction. Gender plays a significant role in the performance of both cognitive, emotional, and symbolic digital housework tasks and in the assumed outcomes of digital housework performance. Digital housework both fosters and transfers gender roles in the household. Also, while digital housework tends to ease the housework performed by women, it creates new opportunities for men.

The implications of these findings are twofold: from a theoretical perspective they offer a theoretical tool of inquiry and from a pragmatic perspective they represent a basis for policy implementation regarding consumer, domestic, and work culture. One limitation of this study is the retrospective methodological approach that underpins the results. Nevertheless, the significance and contribution of this study are that it fills a gap of knowledge regarding the dimensions of digital housework and provide new data on the field of the sociology of work and the sociology of gender that can be further evaluated. As future research directions, digital housework needs to be studied through quantitative sociological investigations in order to understand the impact of domestic technology use on housework, work–life balance, human–technology relations, and the like. By considering digital housework, sociologists, the producers of technologies, and policymakers can better understand the particularities of the domestic and professional work that takes place in the home and take action.

References

Aagaard, L. K. 2023. When Smart Technologies Enter Household Practices: The Gendered Implications of Digital Housekeeping. *Housing, Theory and Society* 40 (1): 60–77.

Beare, E. C., P. O'Raghallaigh, J. McAvoy, J Hayes. 2020. Employees' Emotional Reactions to Digitally Enabled Work Events. *Journal of Decision Systems* 29 (1): 226– 242.

Bond, M. A., L. Punnett, J. L. Pyle, D. Cazeca, M. Cooperman. 2004. Gendered Work Conditions, Health, and Work Outcomes. *Journal of Occupational Health Psychology* 9 (1): 28–45.

Daminger, A. 2019. The Cognitive Dimension of Household Labor. *American Sociological Review* 84 (4): 609–633.

Dant, T. 2001. Fruitbox/Toolbox: Biography and Objects. *Auto/Biography* 9 (1–2): 11–20.

De Vuyst, S., K. Raeymaeckers. 2019. Is Journalism Gender E-Qual? A Study of the Gendered Accumulation and Evaluation of Digital Capital in Journalism. *Digital Journalism* 7 (5): 554–570.

Elizur, D. 1994. Gender and Work Values: A Comparative Analysis. *The Journal of Social Psychology* 134 (2): 201–212.

Geiger, S., E. Stendahl. 2023. Breaching, Bridging, and Bonding: Interweaving Pathways of Social-Symbolic Work in a Flanked Healthcare Movement. *Journal of Management Studies* 61 (6): 1–34.

Hochschild, A. R. 1979. Emotion Work, Feeling Rules, and Social Structure. *American Journal of Sociology* 85 (3): 551–575.

Horst, H., J. Sinanan. 2021. Digital Housekeeping: Living with Data. *New Media & Society* 23 (4): 834–852.

Hoskins, J. 2006. Agency, Biography and Objects. Pp. 74–85 in C. Tilley, W. Keane, S. Küchler, M. Rowlands, and P. Spyer (eds.). *Handbook of Material Culture*. SAGE Publications Ltd.

Karakulak, Ö., T. B. Lawrence. 2024. Social-Symbolic Work in the Construction of Social Problems: Constructing Gender Inequality in Turkish Social Partnerships. *Journal of Business Ethics* 192 (3): 461–486.

Kennedy, J., B. Nansen, M. Arnold, R. Wilken, M. Gibbs. 2015. Digital Housekeepers and Domestic Expertise in the Networked Home. *Convergence* 21 (4): 408–422.

Kopytoff, I. 1986. The Cultural Biography of Things: Commoditization As Process. Pp. 64–91 in A. Appadurai. *The Social Life of Things: Commodities in Cultural Perspective*. New York: Cambridge University Press.

Kosfeld, M., S. Neckermann. 2011. Getting More Work for Nothing? Symbolic Awards and Worker Performance. *American Economic Journal: Microeconomics* 3 (3): 86–99.

Layer, J. K., W. Karwowski, A. Furr. 2009. The Effect of Cognitive Demands and Perceived Quality of Work Life on Human Performance in Manufacturing Environments. *International Journal of Industrial Ergonomics* 39 (2): 413–421.

Lupton, D., S. Pink, H. Horst. 2021. Living in, with and beyond the 'Smart Home': Introduction to the Special Issue. *Convergence* 27 (5): 1147–1154.

Makarius, E. E., B. Z. Larson. 2017. Changing the Perspective of Virtual Work: Building

Virtual Intelligence at the Individual Level. *Academy of Management Perspectives* 31 (2): 159–178.
Martin, R. 2022. Energy housekeeping: intersections of gender, domestic labour and technologies. *Buildings and Cities* 3 (1): 554–569.
Mehta, R. K., R. Parasuraman. 2013. Neuroergonomics: A Review of Applications to Physical and Cognitive Work. *Frontiers in Human Neuroscience* 7: 1–10.
Oakley, A. 2018. *The Sociology of Housework.* 2nd ed. Chicago, IL: Policy Press.
Parker, C. P., B. B. Baltes, S. A. Young, J. W. Huff, R. A. Altmann, H. A. Lacost, J. E. Roberts. 2003. Relationships between Psychological Climate Perceptions and Work Outcomes: A Meta-Analytic Review. *Journal of Organizational Behavior: The International Journal of Industrial, Occupational and Organizational Psychology and Behavior* 24 (4): 389–416.
Potter, P., L. Wolf, S. Boxerman, D. Grayson, J. Sledge, C. Dunagan, B. Evanoff. 2005. Understanding the Cognitive Work of Nursing in the Acute Care Environment. *JONA: The Journal of Nursing Administration* 35 (7): 327–335.
Ragnedda, M. 2018. Conceptualizing Digital Capital. *Telematics and Informatics* 35 (8): 2366– 2375.
Ragnedda, M., M. L. Ruiu. 2020. *Digital Capital: A Bourdieusian Perspective on the Digital Divide.* Bingley, UK: Emerald Publishing Limited.
Rode, J. A., E. S. Poole. 2018. Putting the Gender Back in Digital Housekeeping. *Proceedings of the 4th Conference on Gender & IT.*: 79–90.
Rosenbach, W. E., R. C. Dailey, C. P. Morgan. 1979. Perceptions of Job Characteristics and Affective Work Outcomes for Women and Men. *Sex Roles* 5 (3): 267–277.
Schwanen, T., M. P. Kwan, F. Ren. 2014. The Internet and the Gender Division of Household Labour. *The Geographical Journal* 180 (1): 52–64.
Shourkaei, M. M., K. M. Taylor, B. Dyck. 2024. Examining Sustainable Supply Chain Management Via a Social-Symbolic Work Lens: Lessons from Patagonia. *Business Strategy and the Environment* 33 (2): 1477–1496.
Strazdins, L. M. 2000. Integrating Emotions: Multiple Role Measurement of Emotional Work. *Australian Journal of Psychology* 52 (1): 41–50.
Tolmie, P., A. Crabtree, T. Rodden, C. Greenhalgh, S. Benford. 2007. Making the Home Network at Home: Digital Housekeeping. Pp. 331–350 in *ECSCW 2007: Proceedings of the 10th European Conference on Computer-Supported Cooperative Work.* Limerick: Springer London..
Wang, Y., N. Haggerty. 2011. Individual Virtual Competence and Its Influence on Work Outcomes. *Journal Of Management Information Systems* 27 (4): 299–334.
Whiting, R., G. Symon. 2020. Digi-Housekeeping: The Invisible Work of Flexibility. *Work, Employment and Society* 34 (6): 1079–1096.
Whiting, R., H. Roby, G. Symon, P. Chamakiotis. 2015. Beyond Work and Life: Constructing New Domains in the Digital Age. *EGOS 2015 COLLOQUIUM: Organizations and the Examined life: Reason, Reflexivity and Responsibility.* Athens, Greece: EGOS.
Zapf, D. 2002. Emotion Work and Psychological Well-Being: A Review of the Literature and Some Conceptual Considerations. *Human Resource Management Review* 12 (2): 237– 268.

Alina Silion is a PhD student at the Doctoral School of Sociology, University of Bucharest. She studies digital housework and published articles that address the digital transformation of households and housework. Her research interests include the sociology of everyday life, the sociology of technology, and the sociology of consumption.
ORCID: 0009-0006-1471-4671. Contact: e-mail: alina.silion@s.unibuc.ro.

Appendix 1

Research instrument: section of semi-structured interview design to capture cultural biographies of devices

1. Select one of the newest appliances in your home that you use frequently to do domestic work and describe it in detail. Say everything you think is relevant about it.
1. Pre-purchase period:
1.1. Who purchased this device and when?
1.2. What was the main reason why you decided to buy this new appliance?
1.3. What did you do with the device you had before?
1.4. What did you consider when choosing it? Mention at least three criteria (for example: price, company, appearance, etc.). By what process did you acquire information? How long did it take to find what you wanted?
2. Familiarisation period:
2.1. Who installed and introduced the home appliance? Where is it positioned?
2.2. How did you learn to use this technology? How long did it take you to familiarize yourself with it?
2.3. On a scale of 1 to 5, how well do you feel you use the device domestic? What are its main features that you use? What feature do you know it has but haven't used yet?
3. Use of the appliance:
3.1. Have you customised this device in any particular way? Through specific settings, name, mode of use?
3.2. How do you use this device on a typical day to get things done in the house? What is different when you use it? What did it add? Does it cause you inconvenience in domestic work? Do you also use it for anything else?
3.3. Apart from you, who else uses this device and how?
4. Device maintenance and replacement:
4.1. How do you maintain your home appliance? What exactly do you do? At what point? How often? How long? Do you follow a certain sequential order? How do you organise its maintenance?
4.2. What do you dream of buying related to this device?
4.3. What do you do when the device stops working properly or breaks down? Has it happened? How did you proceed? How would you proceed?
4.4. What are the main reasons why you would change this device?

Appendix 2

Data processing tool: Category schemes for thematic analysis of cognitive, emotional, symbolic and outcome dimensions of digital housework

1. Categories of cognitive digital housework tasks

Domains of digital housework	Cognitive digital tasks
Technology acquisition	Anticipate technological needs
	Plan tech acquisition
	Perceive options accurately
	Identify of suitable options
	Make decisions
	Monitor technological offers
Technology installation	Anticipate technological needs
	Identify best spatial position
	Manage mental workload
	Manage cognitive shifts
Digital literacy	Searching information
	Identify useful information
	Process data
	Make decisions
	Transmit technological knowledge
Technological customisation	Anticipate personal needs
	Identify preferred or needed option
	Make decisions
Technology update	Make decisions
	Manage cognitive shifts
Digital devices and systems automation	Anticipate technological and personal needs
	Identify efficient solutions
	Make decisions
	Monitor technology's actions
	Manage mental fatigue
Technology maintenance	Anticipate technology's needs
	Process the stage and condition of devices
	Identify technological situations
	Check devices
	Make decisions
	Manage mental workload

Technology repair	Identify of technological solutions
	Process the stage and condition of devices
	Make decisions
	Organise tech interventions
	Manage cognitive shifts
	Manage interruptions of tasks

2. Categories of emotion digital housework

Dimensions	Indicators
Emotion work	Emotional dissonance
	Emotional effort
	Companionship behaviour
	Help behaviour
	Regulation behaviour
Feeling rules	Political feminism
	Progressivism
	Environmentalism
	Globalism
Emotion–technology relations	Outcome beliefs
	Motivators
	Personality-technology fit
	Task-technology fit

3. Categories of symbolic digital housework tasks

Types of symbolic work	Identity work
	Boundary work
	Material breach work
	Discursive breach work
	Material bridge work
	Relational bridge work
	Values work
	Amplification work

4. Outcomes of digital housework

Dimensions	Indicators
Symbolic outcomes	Social recognition
	Self-esteem
Practical outcomes	Satisfaction
	Motivation
Material outcomes	Ability to connect to online and offline social networks
	Ability to transfer social capital and activism to the offline realm
	Increased credibility and status within the household
	Use of resources to improve class, position, or status
	Use of online information to resolve household tasks
	Ability to develop a creative lifestyle
	Ability to develop face-to-face interactions
	Ability to develop self-esteem
	Improves abilities to use, verify, absorb, and elaborate online information