



# “Sensing” productivity at home: self-tracking technologies, gender, and labor in Turkey

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## Abstract

This article explores how women in Turkey use sensing technologies to render visible their productivity at home in ways that contest home–workplace boundary under neoliberal, digital capitalism. It does so by focusing on a group of lower- and middle-class women, who work from home as both paid laborers and unpaid caregivers. Although neoliberalism makes it harder to distinguish home and workplace, my digital ethnography highlights that women working from home feel a home–workplace separation that renders invisible their productivity. By translating embodied knowledge into quantified data, smartwatches provide women with new information that I call revelations. Women share these revelations on digital platforms to render visible their productivity at home in ways that transgress the home–workplace boundary. By exploring these revelations as moments of “otherwise,” this article highlights both when smartwatches reproduce neoliberal mentality and become tools for others in the public to register its exploitative consequences.

## Lay Summary

In contemporary economy, it has become more difficult to separate home and workplaces since people increasingly complete job-related tasks at home such as responding to emails. Whereas most people feel productive while working from home, for women from lower- and middle-income groups, it is difficult to feel productive at home. In my study, I focus on women who continue doing housework while also making an income through digital platforms in order to understand how working from home determines their understandings of productivity and labor. I observe that women working from home use smartwatch data to challenge the invisibility imposed on their labor and productivity. By sharing information such as daily step count, they aim to prove that one can be productive at home and that domestic work is as arduous as paid labor. These observations show that the recommended minimum number of steps typically suggested by health experts—usually around 8,000 steps—address a target group of people with white-collar desk jobs, ignoring women’s labor at home.

**Keywords:** self-tracking, sensors, domestic labor, productivity, home–workplace separation, neoliberal/digital capitalism, gender

Semra, a stay-at-home mother with four kids all under the age of 10 years, shares an Instagram story where she photographed the smartwatch on her wrist, displaying 273 kcal spent by 10:34 a.m. In the blurry background, a 3-year-old girl with a ponytail plays on a carpet. The caption of the story reads: “Life (*Hayatlar*)” followed by three exploding fire emojis. The next story, which is a follow-up to the first, shows a photograph of a gray cat with sleepy, light-yellow eyes, laying on a black table. The caption at the bottom reads “Dreams (*Hayaller*)” followed by an empty white thought balloon. “Life vs. Dreams” is a popular internet trope that contrasts reality with expectations or desires in a sarcastic manner. With a picture of her smartwatch calorie count and her child in the blurry background, Semra highlights the amount of care work she has accomplished at home before noon. She uses the data collected by the sensor on her wrist to quantify how much labor it takes to take care of four children. The time is an important marker as it points to the longevity of her morning laboring hours. At a time which many considered early, she has done work that is quantified as 237 kcal, which matches approximately 7,000 steps. The follow-up story fortifies her expression of this effort by pointing to her need to rest as she imagines herself, rather than the cat, laying down with half open eyes.

In this article, I explore how a group of women in Turkey share self-tracking data such as step counts or calorie scores

on Instagram to render visible their productivity at home. Semra’s Instagram story using smartwatch data is only one example. Many women share Instagram stories, posts, or WhatsApp messages with friends, family, and followers to document their labor at home in the form of calories, kilometers, and step counts. As Eda, a married woman with one child, states, “it is now a thing” among women to share their step counts daily to express the amount of labor they spend at home.

My interlocutors, including Eda and Semra, are women mostly in their 30s and 40s who are primary caregivers in their families. They are either married with or without children or single mothers. They are also paid digital laborers, making an income through digital platforms such as Instagram and WhatsApp. Most of my respondents are educated middle-class women, whereas a minority of them are lower-class, primary school graduates. What all of them have in common across class, educational level, or marital status is that they quit their professional 9–5 jobs after either having children or experiencing workplace alienation and “created an Instagram account,” as the beginning of a process that, with time, has become an alternative source of income. Some have used the web to share their healthy dietary routines, some to post about the struggles of motherhood, while others have used it to lead weight-loss motivation groups. In time, they have reached a sizeable followership on

Instagram—from 10K to 140K followers—that help them create a source of income. Home, for my respondents, therefore, is a space where they not only care for their families but also carry out paid digital labor.

Women turn to digital mediums such as Instagram and smartwatches to quantify their labor because they feel that their productivity at home remains invisible due to the newly redrawn boundaries between home and workplace under neoliberal, digital capitalism. Most accounts of neoliberalism suggest that neoliberalization has made it more difficult to draw a boundary between home and workplaces since “the difference between work and pleasure, and between creativity and productivity, has become increasingly less aligned with particular locations or types of work” (McEwen, 2017, p. 240; Weeks, 2011). The advent of digitization and high-technology capitalism intensified this amorphous relationship as the components of social life, such as “cooperative social relationships, interpersonal communication, affective intensities both inside and outside the workplace” began to be more directly informed by the logics of the capital, turning home into a locus of productivity (Harvey, 2005; Jarrett, 2016, p. 31; Marazzi, 2011).

Although neoliberalism makes it harder to distinguish these two spheres, my digital ethnography shows that a certain form of home–workplace distinction remains intact for women. Women feel that their labor and productivity remain invisible simply because they work from home. Work for these women includes both unpaid and paid labor; they care for their children, cook, clean—tasks that do not have immediate monetary return—and they oversee motivation groups via WhatsApp, Zoom, or posting on Instagram—tasks that generate income. Women struggle to prove their productivity when completing both types of tasks because they think that working at a designated workplace is still the precondition to be registered as productive. In other words, while neoliberalization more readily renders home a space of productive activity, not everyone has the proper contextual or dispositional markers to be registered as productive. When experienced by women—subjects of invisible labor—within the bounds of home—a space that traditionally renders productivity and labor invisible—productivity becomes harder to attain.

Sensors, in the form of self-tracking technologies of smartwatches and smart wristbands, become important for women as they use these technologies and digital platforms in order to transgress newly redrawn home–workplace boundaries in neoliberalism. The screens of smartwatches or smart wristbands provide numerical information to women about how much work they accomplish at home. Women share the photograph of these screens on Instagram to quantify and put on public display their normally invisible gendered productivity. Based on these public displays, I first suggest that by showing their productivity with sensor-mediated data, women reproduce the neoliberal dominance of productivity. They do so in two ways. First, the self-tracking numbers shared on Instagram quantify labor at home in ways that emphasize productivity as an important factor ordering life at home. Second, through sensing technologies, women make a temporal distinction between paid and unpaid labor in a way that ensures that they maintain a certain level of productivity. Both ways of adopting smartwatches help neoliberal mentality to render home a locus of productivity by helping women to guarantee that their productivity at home matches the market-induced levels of productivity.

Yet, I also argue that proving/maintaining productivity in the case of women does more than just contribute to strengthening neoliberal dominance of productivity. It also allows women to challenge the capitalist exploitation of their labor to a certain extent by putting on public display what has historically remained invisible since the outset of capitalism. I coin the term “revelations” to refer to this process of understanding labor from a more critical perspective with the help of quantified sensor-mediated data. Marxist Feminists such as Leopoldina Fortunati (1995) and Silvia Federici (2012) among others show that, in pre-neoliberal forms of capital accumulation, the boundary between home and workplaces elided housework’s contribution in the production of the surplus value. In so doing, the distinction disguised the exploitation of women as laborers, normalizing the unpaid nature of housework through tropes such as the nuclear family. My respondents, however, are not the partners of typical factory workers in early capitalism (see also Bulut, 2020). Apart from caring for their families, they are also digital laborers earning an income. Their access to digital technologies such as self-tracking devices and their wider experiences with digital platforms as means to generate income provide them with new data and resources to render visible labor at home. As these devices translate embodied knowledge into quantified, publicly shareable data, they also culminate in revelations that allow some women to more strongly argue that labor at home is as arduous as organized labor at workplaces—an insight that has been long silenced by notions of productive labor that prioritize immediate monetary return.

I start the discussion by explaining what I mean by revelations and how this concept expands the current scholarly discussions about sensing technologies, influencers, and Instagram mothers. After detailing the methods of my study, the following section focuses on the narratives of women who feel a home–workplace boundary and how women post smartwatch numbers on Instagram to transgress this distinction. I then move on to examine how women integrate sensing technologies into their lives in ways that reproduce the dominance of productivity as a value. The next section complicates the discussion in the previous section by highlighting how sensing technologies also help women to render visible exploitation of their labor.

## Literature review, theoretical framework, and methods

My analysis of middle- and lower-class women’s uses of self-tracking devices expands the nascent literature on the socio-political life built around sensors by highlighting an underexamined strand of information collected by sensing technologies which I call “revelations.” Revelations refer to a new form of data that self-trackers collect unintentionally or information that women have not been aware of gathering, such as the demanding and invisible nature of laboring at home. Revelations are different from the types of data underlined by scholarly discussions on sensor-mediated communication, such as data about fitness/health or big data. As Deborah Lupton (2016) highlights, self-tracking data about fitness/health (LiKimWa, 2012; Ruckenstein, 2014) is a form of information “people knowingly and purposively collect” about themselves (p. 9). A revelation, however, happens *after* women make sense of the numbers on self-tracking devices within their daily context; so they neither *aim* to collect this

information at the outset nor are *aware* of gathering it, until they see the numbers.

Revelations are similar to big data in the sense that they are a covert or hidden form of information collected by sensing technologies (Humphrey, 2022; Klauser & Albrecht, 2014). Yet, unlike big data, which can be deciphered only by tech companies, individuals themselves translate the numbers they see on their screens into a meaningful expression of their daily struggles—such as women expressing labor-intensive nature of work at home. Revelations emerge when sensing technologies transform implicit knowledge such as embodied exploitation—the invisible nature of laboring at home—into something more knowable and shareable. Hence, whereas commodified big data helps major tech companies to expand their profits (Terranova, 2014), sensor-driven revelations, as moments of “otherwise” (Povinelli, 2011), may help strengthen people’s awareness of inequalities. If quantification is open to alternative readings (Dixon-Román, 2016) and numbers are no longer abstract, universal concepts (Deleuze & Guattari, 1987), the numbers people see on their individual screens may gain meanings beyond health and fitness—meanings that are also beyond their contribution to the revenues of tech companies.

In this sense, putting smartwatch numbers on public display via Instagram is part of a “visibility game” (Cotter, 2019); however, not one played with platform metrics—as most influencers do to increase and maintain their digital visibility (Bishop, 2019; O’Meara, 2019). “Quantifiable markers” (Duffy et al., 2021, p. 3.) here are numbers provided by sensing technologies. The visibility at stake is not digital fame but the labor that remains hidden behind such fame. Unlike most “mummy influencers” who do not problematize work from home (Duffy & Pruchniewska, 2017; Duffy et al., 2021), the “visibility labor” (Abidin, 2018) of my interlocutors questions the home–workplace separation that disguises gendered productivity at home in the form of either housework or digital labor. Women mostly raise these questions as mothers who quit their previous 9–5 jobs to care for their newborns. The invisibility of their productivity, therefore, is in part a result of the neoliberal “erosion of public social infrastructures,” such as publicly funded day cares, (Wilson & Yochim 2017, p. 22), that has “marginalized women from career-track employment” (Lukacs, 2020). Revelations built around self-tracking numbers and displayed on digital platforms reflect women’s experiences of this neoliberal erosion while also making up for it with proof of productivity at home.

My analysis draws on digital ethnography and in-depth interviews conducted with 21 woman Instagram users (Supplementary Appendix 1) during the course of a 4-month research period. In addition to observing their Instagram activity, during this period, I actively participated in WhatsApp motivation groups. I then interviewed women to make sense of their digital activity outside of the virtual world by discussing with them the meanings of their posts displaying self-tracking data. The digital ethnography about woman self-trackers and Instagram users is part of my larger research project about the history of new media technologies in Turkey. In this project, I focus on Turkey’s three major new media moments: radio in the 1920s, television in the 1950s, and mobile devices in the 2000s. In so doing, I examine how the constructions of media novelty change with shifting political economic conditions—from industrial developmentalism

to neoliberalism. This article is based on the portion of the project in which I explore how the current political economic order of neoliberalism informs lower- and middle-class women’s engagements with digital media, the new media of the contemporary moment.

In this article, I base my analysis on the narratives of a selected group of women that reflect the diversity among my participants across class, educational and occupational background, marital status, and digital media use (Supplementary Appendix 2). I use pseudonyms to respect their privacy. I explore their digital media use through a theoretical framework that synthesizes classic Marxist Feminist critiques of the gendered division of labor (Federici, 2012; Fortunati, 1995) with the current analysis of neoliberal, digital labor from a gendered perspective (Jarrett, 2016) with a focus on self-tracking (Lupton, 2016; McEwen, 2017).

### Home–workplace boundary and quantifying productivity at home

My respondents feel a home–workplace separation because they think that people working at designated workplaces are more readily considered productive. Their feelings of invisibility when working at home both as unpaid caregivers and paid digital laborers culminate in Instagram posts or stories that display numbers collected by sensing technologies as signs of productivity. In so doing, I suggest that these posts aim to transgress the home–workplace distinction by showing, in quantified terms, how productive women are at home.

Eda, a “mind body eating coach” in her thirties, is one of these women. Eda has a university degree and work experience as a drama teacher. Because of a risky pregnancy she quit her job and, after having her child, in her words, experienced her “small version of the pandemic” as she was “imprisoned in her home” for 2 years. Eda’s story parallels those of many other women who are in the work force until pregnancy and has to quit their jobs to care for their newborns (Yaman, 2020). When her child began taking part in a play group at the age of 2 years, Eda, with more time in her hands, created an Instagram page where she shared the details of how to pursue a healthy diet. After completing many certificate programs about healthy eating and mindfulness, Eda is now making an income as a healthy eating coach and her Instagram account has now some 60K followers.

On one of her busy days, Eda shared a picture of her smartwatch displaying her having walked 10.53 km that day. In the caption she stated:

I walked 6 km in the morning and spent the rest of the day at home by doing mostly housework. I walked 4.5 km in an apartment that is only 120 square meters. What did I do all day? Nothing.

Eda’s Instagram post verbally and numerically captured the moment of her revelation about an internalized norm that she already knew. The usual invisibility of housework hid the fact that her domestic tasks could amount to 4.5 km of walking in 120 m<sup>2</sup>. Thus, the post, as published on a public venue such as Instagram, opened an alternative ground for understanding housework that recognized its productive character.

Eda’s revelation is a moment of “otherwise” (Povinelli, 2011) as it aims to produce a new perspective about housework. With her concept of “the otherwise,” Elizabeth

Povinelli (2011) underlines nascent life forms or worlds that tweak internalized power structures or norms with alternative social projects. These alternative projects are usually not complete in the sense that they do not necessarily challenge and dismantle a dominant norm. Yet, they have the potential to produce “something new,” that differs from the dominant norm (Povinelli, 2011, p. 10). Revelations, then, are brief moments of “otherwise” (Povinelli, 2011) that express “an internal, secret, and hidden” (Foucault, 2004, p. 184) norm in more tangible ways as they rely on numbers—a form of data more readily shareable with others. They emerge when people “see themselves in the data” (Winiecki, 2007, p. 365) in a new way, which helps them more directly articulate what they already know in an implicit manner. The implicit knowledge here in Eda’s case refers to an internalized norm about the invisibility of housework. Her revelation, as captured by the post displaying housework in kilometers, offers an alternative way of recognizing the effort-intensive/time-consuming nature of work from or at home.

When I asked Eda if the new/alternative perspective she aimed to promote with her post was revealing the unjust distribution of domestic labor between men and women, she responded that, it was more the home–workplace separation she was criticizing:

I would not call it unjust since a man could also be staying at home doing these tasks, although this is very rare in Turkey. People who work outside are considered to be “working” whereas people who stay at home simply look as if they are doing nothing. Instead, my posts reveal what these people who stay at home are accomplishing all day.

Eda’s “alternative project” then aimed to transgress the home–workplace separation that rendered housework invisible.

Another participant, Tülin, concurred with Eda about the difficulty of proving her productivity to others as a woman working from home. Tülin is a newly married, 30-year-old woman with a university degree and work experience in the advertisement and food industries. She quit her job after getting married during the pandemic, since it became difficult for her to keep up with the busy work schedule. She has created an Instagram account to inform people about functional eating and now has 16K followers. She regularly shares the recipes that she creates in the form of short videos, less than a minute long. Tülin does not regularly earn income from her page although she has started some collaborations with healthy food brands.

Tülin had a group of friends that she added to her smartwatch application. She stated how automatically sharing the step count with friends working at office jobs reproduced this notion of home as a space of leisure:

Some of my friends cannot move that much during the day because they work at office jobs. They see that you exercised for 60 minutes that day. Sometimes when I only climb up and down of the stairs the watch shows it as an exercise. The other person then thinks that ... “so nice that she can exercise,” but I am working here.

Tülin’s words stressed that when seen from the eyes of others, especially those working at designated workplaces, her step counts made her appear as if she was not working.

Her friends at office jobs automatically registered her labor at home as leisurely physical exercise.

Similar to Eda, Tülin also used Instagram to promote alternative vision about housework. In one of her Instagram stories, she shared a photograph of her smartwatch displaying a 14,172 step count. In the story Tülin wrote: “This week is such a busy week that my minimum daily step count is always around these numbers.” In another caption at the bottom, she added: “too much movement is too much (*hareketin de fazlası fazla*).” Upon my question about the motivation behind sharing this story, Tülin said:

I worked too much, I moved too much, I am very tired. I want to convince others of the fact that although I might appear to be doing nothing, I am moving a lot because I am working. ... [I want to give this message] mostly to my followers but also to the family. I just got married and joined a new family and right after that I quit my job and turned all my attention to social media. ... There were moments when I did not feel productive at all because I shifted from a very busy work schedule to a light tempo.

Tülin’s previous work experience made her feel unproductive at home, as the work schedule she had at home was “light” compared to her previously tight corporate work schedule. Similar to Eda, the smartwatch numbers played a role in how she approached her time at home in a new way as the numbers quantified her productivity in a more tangible manner.

Both Eda’s and Tülin’s posts used indirect language because, rather than directly telling their followers “work at/home was labor too,” both wanted their followers to go through the same revelation process they did after seeing the numbers. Eda’s post ended with a sarcastic question and answer that defined housework as “nothing.” Similarly, Tülin chose more indirect language in which she first defined her week as “busy” then complained about “too much movement.” The details they both gave about their days—Eda referring to how much she walked in the morning and Tülin describing her busy week—were contextual markers they included for their followers to use while making sense of the smartwatch numbers. By referring to these contextual markers, they wanted their followers to make sense of the smartwatch numbers in new ways, rather than quickly registering them as leisurely physical exercise. When the addressee was others, the revelations were expressed with an indirect and an implicit tone—rather than a direct confrontation—in order to create a questioning process that mimicked the one that my respondents went through after seeing the numbers.

Tülin and Eda felt the need to prove that they were productive at home when juxtaposed with the terms of productivity determined by people working at office jobs. Such an urge shows that the translation of market productivity into “home” is not a seamless act. Promoting the alternative vision about housework, therefore, requires a less confrontational tone since a revelation, if can be mimicked, is a more effective way to promote this alternative vision. Instagram posts and stories displaying smartwatch numbers with sarcastic and implicit captions aim to invite others to have the same revelations about work from home even if they do not have the same experience with women working from home. While reinforcing a conception of home as a space that makes it hard to achieve productivity, home–workplace separation, also creates an urge to transgress this distinction, culminating

in the posts that aim to trigger revelations questioning this very distinction.

### Turning home into a locus of productivity: reproducing neoliberal mentality

By creating an urge among women to transgress it, home-workplace separation acts as a useful device to enforce productivity. As women prove with step counts and calorie scores how productive they can be at home, they also contribute to the dominance of productivity as one of the most important values of the neoliberal order. In a sense, my participants question the norm about the invisibility of housework by emphasizing another norm, that is productivity. The alternative vision women want to promote about housework, therefore, relies too much on another norm in part to give their revelation a public credibility. When Eda on her Instagram post uses a phrase such as “nothing” to describe her activity at home that matches a walk of 4.5 km, she implicitly highlights how domestic work should be acknowledged as productivity. Similarly, when Tülin complains that “too much movement is too much” on her Instagram story, she wants to convince her audience, which includes friends with office jobs and immediate family, that she is a productive person although as a woman working from home, she may seem to be sitting or exercising all day. Women integrate sensing technologies into their lives to prove that that their productivity at home—as a space notorious for rendering labor invisible—is in line with the level of productivity determined by the market economy. The home-workplace boundary then helps neoliberal mentality to render home a locus of productivity by inviting women to show in numerical terms that it is possible to be productive at home.

In addition to proving productivity in numerical terms, sensing technologies also reinforce the neoliberal authority of productivity at home by helping women to temporally distinguish paid labor from care work. Some women adopt smartwatches as personal assistants that arrange their time as digital laborers and as mothers. Women use their smartwatches to decide when to focus on paid work and when to focus on housework. Given the constant attention that digital platforms require, women manage their presence at home with children through their smartwatch, a process that becomes a means to distinguish essential work from distraction. Like other women who share self-tracking numbers to render visible their productivity, with this distinction these women want to guarantee that productivity at home matches the market-induced levels of productivity. Bilge and Aylin are women who adopt sensing technologies for this purpose.

Bilge, who has 30K followers on Instagram, started using digital platforms as a single mother of two toddlers “feeling alone” after her divorce. Previously a schoolteacher, for Bilge, Instagram turned into a source of income after she had to take care of her children. At first, she was sharing her struggles as a single parent, which connected her to other women in similar situations. She now conducts paid online groups that meet regularly to read self-help books or discuss creative writing practices. Bilge stated that her smartwatch replaced a personal assistant, which she could not afford, and helped her manage her digital presence and her presence at home as a mother with a temporal division:

Although I might be making a living through digital world, in fact, I am not present digitally most of the time. I am present in the moment. I only have a connection with the digital world. What helps me to remain present in the moment are the digital technologies themselves. I can hear when my child calls me because this [showing her smartwatch] is on my wrist. . . . I do not have to constantly check my phone for my job, I see it here and if it is something that needs a response, I respond.

By using a smartwatch as her personal assistant, Bilge made a much-needed distinction between paid and unpaid labor as a woman working from home with two kids who required her care and attention. It was not possible for her to block all digital notifications as she might receive a call related to her job while taking care of her children or about her children while in a meeting. Her smartwatch helped her filter out unnecessary calls depending on where she wanted to be present, temporally.

Aylin, married with one child, similarly managed the boundary between paid labor and childcare through her smartwatch:

The feature I use most is that it [the smartwatch] allows me to get away from my phone. For instance, we are playing Lego with Ali (her son) and I hear the phone ringing. I decide if it is a person worth responding to or not. It makes me feel like a mother who does not run to her phone all the time but who stays in the play, in the moment. It helps me be the same person when I cook, or when I work.

Aylin makes a living with the collaborations she develops through her Instagram page, which has around 150K followers. After working in the media industry, Aylin wanted to have a more manageable work schedule that would allow her to spend time with her son. Her Instagram account became popular with her sarcastic posts that revealed the difficulties of motherhood. Like Bilge, Aylin used smartwatch to distinguish between different modes of labor, allowing her, in her own words, “to be the same person” when she cooked or when she worked—one who met the requirements of paid labor or care work without distractions.

Smartwatch as a personal assistant helps to reproduce market-induced notions of productivity in Bilge and Aylin’s lives by leaving no room for “interstitial time.” Shira Chess (2018) defines “interstitial time” as “small spaces of time—gaps of time that are not used for anything else” (p. 111). When Bilge and Aylin mention that their smartwatch helps them to be “present” when they are acting as digital laborers or caregivers, they also implicitly highlight that there is no time for interstitial time—no gap when they do nothing or no “time that is not used for other purposes” (Chess, 2018, p. 111). They either care for their children, cook, or answer calls related to their paid work as digital laborers. Sensing technologies help them divide their attention among these tasks in a way that leaves no room for just sitting or doing nothing. Whereas smartwatch numbers help women to show that housework cannot be reduced to “doing nothing”—which was the case in Eda’s posts—the smartwatch as a personal assistant helps them to ensure that no room is left in their schedule to do “nothing.” Consistent with what Alison Harvey (2018) discusses in the context of videogames that colonize women’s leisure time with a type of “ludic

productivity” (Harvey, 2018, p. 667), smartwatches help women remain productive—or render productivity as the most important value—in both unpaid care work and paid digital practices.

Sensing technologies as personal assistants, however, also culminate in the revelations about the absence of interstitial time in women’s schedules with their built-in features sending notifications to make room for empty time. In addition to showing women the calls on their phones or scheduled meetings, smartwatches also send them reminders about taking a break to observe activities of mindfulness, such as meditation. However, women, such as Pelin, underline the difficulty of taking these breaks even when they receive these “smart” reminders. Pelin is in her early thirties and married with two children. She has a university degree and previous work experience in various NGOs. After having her first child, she quit her job to take care of her newborn and created a blog to share her struggles as a mother. Her digital presence continued on Instagram, with an account of 14K followers. She is now working to turn Instagram into a steadier source of income by registering as an influencer with platforms such as Amazon. In one of her Instagram stories, Pelin shared the screen of her smartwatch that displayed a warning: “It is time for you to go back to your inner world: I wonder what is waiting for you in today’s meditation practice?” Right above the watch’s picture, Pelin responded to her watch’s invitation with the caption: “I welcome separating winter clothes from summer clothes as a type of meditation.”

The very reminder to pause invited Pelin to make sense of what she was doing in a new way, culminating in the revelation that pausing for her was possible only through domestic work. What Pelin was doing gained a different meaning against the backdrop of the watch’s warning. If it was time to take a break for meditation, grouping clothes was her form of meditation as a mother caring for two children on her own. This inner monologue expressed on Instagram highlighted the revelation that for women interstitial time overlapped with domestic work. As much as addressing her followers, with her story, Pelin also responded to the technology on her wrist. Symptomatic of women’s time under neoliberalism, she had only “piecemeal” (Chess, 2018; Harvey, 2018, p. 667) time slots in between domestic tasks, some of which could pass as meditation by requiring less mental attention.

As neoliberalism leaves no real support mechanisms for women in care work, it also leaves few options for women but to arrange their agendas in a way that prioritizes productivity over interstitial time. Aylin, Bilge, and Pelin are the primary caregivers to their children and in the absence of easily accessible public daycares, they shoulder the double burden of making an income and caring for their families. Aylin and Pelin share the financial burden of supporting their families with their husbands but Bilge is the sole income earner in her household. They all maintain their families by also taking on the responsibility to raise their children, which in the case of Aylin and Pelin also helps their husbands to maintain their office jobs. As Julie A. Wilson and Emily Chivers Yochim (2017) underline, “advanced neoliberalism proceeds largely through women,” such as Aylin, Bilge, and Pelin, “as it is mothers’ affective labors as the naturalized caregivers and keepers of the domestic realm” that make precarization possible (p. 22). The burden of making up for absent social support infrastructures requires arranging every minute of life at

home in way that makes sure each second is spent productively.

Gendered experience of time and productivity at home, therefore, highlights that as much as being a physical space that combines paid and unpaid work, home is also defined by a certain temporal framework that prioritizes productive time—either in the form of care work or digital labor—over interstitial time. Knowing that home is a workplace for them despite not being registered as such in public accounts, women employ sensing technologies on their wrist to make sure that they are “present,” hence, productive in both paid and unpaid labor. As these technologies allow them to control their time and to allocate “piecemeal” time slots between paid and unpaid labor, they also remind them about the interstitial time, which can find a place for itself only when merged with a productive activity, such as grouping clothes seasonally in Pelin’s case. For Pelin, Aylin, Bilge, and others “in-between time is not idle” (Kim, 2021, p. 15); it is yet another neoliberal choice to maximize their productivity.

### Revealing gendered exploitation: quantifying invisible labor

Pelin’s revelation about the impossibility of pausing—or some form of domestic work being the only possibility for pausing—includes an implicit critique about the absence of interstitial time in woman’s schedules. The potential in such moments of otherwise, as expressed through revelations, more than simply reproduces neoliberal dominance of productivity. It also allows women to render visible what normally remains invisible, which is their labor at home. In so doing, revelations shaped around these numbers also challenge the exploitation of women’s labor, especially their domestic work, to a certain extent. As Marxists feminists have underscored, part of capitalist exploitation of women’s labor results from a home–workplace boundary that renders invisible this labor and makes it count toward “nothing.” This boundary hides the crucial role of the practices carried out at home—such as cooking, laundry, childcare, and other affect-intensive care work—in both the reproduction of the laborer and the production of the surplus value (Federici, 2012; Fortunati, 1995).

When women put on public display the numbers that quantify their labor at home, they also partially challenge this capitalist exploitation that imposes invisibility. As mentioned, revelations shaped around self-tracking numbers offer new perspectives about especially domestic work by translating implicit cultivations into deliberate expressions of quantified data. Embodied knowledge about the effort-intensive character of housework is one such implicit cultivation that finds a new way of expression through calorie scores or step counts. Women of course do not become aware of the demanding nature of housework after seeing step counts, calories, or kilometers. However, smartwatch data show this effort in a more tangible manner and what women know in embodied form becomes a more deliberate expression. If capitalist exploitation in part reduces accomplishing domestic tasks to accomplishing “nothing,” contesting such feelings of emptiness with self-tracking numbers also contests, to a certain extent, such capitalist exploitation enforcing invisibility. Revelations built around smartwatch numbers quantify and put on public display the labor-intensive nature of work at home, turning it into a matter of public discussion—first within women’s close

circles then with a larger group via Instagram, which also culminated in the writing of this very article.

Semra, whose Instagram story I mentioned in the beginning of this article, expressed the revelation she had about work at home after seeing her smartwatch numbers. She used the word “proof” to describe her sense of tangibility when she saw her step count even though she already knew she felt tired after taking care of four children on her own. Semra stated:

Right now it is 6:25 PM here. I did not clean today, only cooked and looked after my children. Since morning I have climbed 17 floors, we have a three-story house. I did not leave the house at all today, I only dressed the kids, put them in bed and woke them up, and fed them. And it is 12,000 steps with these activities. What I am saying is these numbers provide you with proof of why you feel tired.

In Semra’s words, the revelation she had after seeing smartwatch numbers was a proof of why her body felt tired after taking care of her four children.

Tülin, whom I introduced earlier, similarly expressed the experience of tangibility emerging through smartwatch numbers with the following words:

As a person I like being productive and sometimes when I look at my step count, I say “ok, I did not sit down that much today.” This is a weird experience for me because in fact you know that you did not sit down all day but seeing this on the screen of the smartwatch convinces you of this fact or something? I do not know.

Revelations are more deliberate expressions of embodied fatigue because numbers convince Tülin of and prove to Semra this bodily state. Here, Tülin’s use of convincing resonates with Semra’s use of proof. Tülin says that although she already knows that she did not sit down all day, seeing this embodied knowledge in numerical format gives her a strange feeling that she compares with an act of being convinced. The invisibility of labor spent at home also informs how women approach the embodied knowledge of domestic work or how their body feels after this work. On one hand, women know that they worked hard. On the other hand, they have a certain sense of uncertainty, a lack of proof in Semra’s words or they need one more thing to be convinced, as Tülin highlights. As the public registers this work as “nothing,” women’s awareness of the arduous nature of domestic work requires one more step that would transform embodied knowledge into something that is more tangible such as numerical information. Smartwatch numbers give women this needed tangible proof to express their embodied knowledge.

When shared with others, revelations gain a more openly affective character, accompanied by a sense of surprise or amazement—in a moment of otherwise, carrying the potential to criticize gendered character of housework. Ayşe, for example, was surprised by the step count other women reached by doing housework, apprehending the demanding nature of housework from a more collective perspective. Ayşe is a 37-year-old woman with three children. A primary school graduate who worked in the mining industry as a laborer, Ayşe used to make a living by separating valuable stones from invaluable ones. She is now “a life and nutrition coach” with an Instagram account of 10K followers and leads paid

motivation groups with women who want to lose weight. Ayşe had to quit her job after getting pregnant and was, in her words, “locked inside the house.” She gained “so much weight” during this time that one day she decided to go on a diet that she herself put together from Internet research. Her weight loss success inspired first her neighbors than their acquaintances, and with time, her Instagram account reached to 10K followers. After earning an affordable coaching certificate, Ayşe is now leading WhatsApp motivation groups for weight loss. Since these groups are initially free—but later require payment for longer participation—her followers are mostly lower-class women like herself.

In her free WhatsApp motivation groups, Ayşe requires the group participants to share a video in which they complete their daily exercises along with their daily step counts and weekly weight. During our interview, she expressed her surprise at seeing some of these numbers on her WhatsApp feed:

I sometimes see step counts such as 25,000 on my WhatsApp feed. Then I ask “girl (*kız*), where did you walk this much?” to which they reply “sister (*abla*) I swear I did not leave home, I just cleaned the doors and the windows, and it was already 25,000. If I dance to the exercise you give us, then it reaches to 28,000.” Then, I find myself thinking “I also do not leave the apartment, but I barely complete 10,000 steps. That means I circle the house much less than these women.”

The revelation Ayşe had after comparing her numbers with that of others was that she did much less domestic work than her followers—even when she completed 10,000 steps. On the weight-loss WhatsApp group Ayşe led, the conversation over step count easily shifted from fitness to housework and childcare. Women with small children were the ones who reached the greatest number of steps, which impressed the other group members. Once, group member Zeynep sent a photograph of her smart wristband displaying 27,000 steps. Another group member, Hilal, asked how she achieved that number, adding “congratulations” at the end of the message. Rather than highlighting how she made time for exercising, Zeynep emphasized that it was impossible to be sedentary with two toddlers who needed to spend time outside every day.

The sense of astonishment that arises from seeing how much more other women accomplish while doing housework occurs in part because of housework’s publicly invisible nature. As Shosana Zuboff (1988) observes, IT systems incorporated into factory work “informatize” laborers about their activities, giving background information about their production practices and rendering tangible and sharable—in the form of quantified data—what was hitherto embodied knowledge. Self-tracking data similarly make the embodied experience of domestic work “visible, knowable and shareable” (Jarrett, 2016, p. 35; Zuboff, 1988) not only vis a vis the public but also within women. When collectively experienced, the invisibility of housework fuels a sense of astonishment among women who see one another’s numbers. The affective character of revelations emerges in tension with this collectively gendered experience and the very invisibility of this experience, not only to others but also to women themselves.

The affective character of the revelations is also shared in a way that leads women to criticize the gendered character of housework. Tülin, for example, compared her daily step

count with her husband’s and suggested that this comparison surprised her husband as he noticed how much more work she did at home:

You look like you are doing nothing during the day, but, for instance, my husband sits in front of the computer when he is at home and he thinks that I also spend time in front of the computer. When we compare our step counts at the end of the day, my number is always 3,000-4,000 higher than his. He is always like “oh wow, what did you do that much? (*oha, ne yaptın o kadar?*)” Well, in the meantime, I do not know, I cooked this meal, hung out the laundry, . . . But as if these things are our duty, as if they are a must, I do not know how to say it but most of us, if we are working from home as if we are [as women] coded to do these things (*bunları yapmaya kodlanmış gibiyiz*), probably by our families. . . . Since [at home] we think that “oh, whatever, I will do this, I will do that” and we reach to 10,000 steps without even noticing.

Tülin’s husband’s astonishment led her to raise a critique of gendered division of labor. To her, this numerical difference revealed the assumption that it was because she was raised as a woman that chores such as cooking or laundry were automatically her duties. The fact that her husband did not notice Tülin doing housework even when he was at home was an indication of the invisibility of housework even to the people who shared the same space with women. Comparing their step counts revealed to Tülin’s husband, with a sense of astonishment, how much more work Tülin did at home. The affective character of Tülin’s husband’s revelation, then, allowed Tülin to frame her revelation more openly as a critique of gendered division of labor.

Apart from the gendered critique, moments of otherwise captured by revelations also liken domestic work to paid work at designated workplaces. By posting her step counts on Instagram Eda, introduced earlier, critically highlighted domestic work’s affinities with organized labor in workplaces. The post had a picture of her smartwatch displaying some 17,000 steps she took, 13 km she walked, and 19 flights she climbed during one single day. The first caption on the upper right corner of the picture read:

In addition to rotting my youth in the kitchen, I printed some documents, brought my son to the park, did some grocery shopping but at the end of the day the question remains; ‘what have you done today?’ ‘Nothing...’ #houseworkungratefulhoney

The caption on the lower right of the picture added:

I celebrate all invisible laborers\* day already.  
\*A person who does the job [described by] the verb in the sentence but, like the hidden subject, no one talks about her.

The revelation Eda shared with her followers—in again a sarcastic tone—took its potential to mimic the same revelation among her followers with its reference to the upcoming May 1st Labor Day in two weeks. Her reference to the Labor Day holiday, with an emphasis on housework’s invisibility, pointed to the similarities between organized paid labor and invisible labor at home. Although housework played a central

role in the reproduction of the laboring body, “the activities of a domestic laborer were rarely experienced in the same way as organized, industrialized work” (Jarrett, 2016, p. 3). In referring to the Labor Day, Eda, however, highlighted the revelation that labor involved in housework was not that different from other forms of organized labor honored with the May Day parades.

Karen Dewert McEwen (2016) proposes that “discourses of self-knowledge, self-discovery, and gamification frequently frame self-trackers’ understanding of themselves as laborers, thus reproducing and deepening capitalist subjectivities” (p. 237). Sensor data also allows some of my respondents to see themselves more concretely as laborers. Yet, unlike what McEwen suggests, I argue that approaching oneself as a laborer does not always serve the interests of capital, especially if this revelation takes place in a space that is not traditionally associated with the proper modes of laboring. If the ostensible distinction between home and workplace is why women’s labor at home remains invisible and unpaid, the new forms of data women collect with sensing devices and share through digital platforms challenge this invisibility and attempt to contest capitalist exploitation that render domestic work invisible.

Whereas revelations, built around smartwatch data, of my middle-class participants such as Eda and Tülin, openly criticize the gendered and invisible nature of domestic work on Instagram, the revelations of my lower-class participants raise a more performative critique of the gendered nature of housework. Unlike middle-class respondents who mostly have high-quality Apple Watches, Ayşe and other lower-class participants have cheaper brands of smart wristbands. They frequently complained that cheap wristbands were not sustainable as they stopped working upon contact with water, something women doing housework could not avoid. During our interview, Ayşe herself mentioned the number of smart wristbands that she broke, and I observed similar complaints on the WhatsApp groups. Some suggested applying to the public health centers that provide free self-tracking devices to overweight people. Not everyone was eligible, however, for this option as it required one to be above 80 kg. Broken devices were a frequent matter of discussion among group members such that one day Ayşe directly asked me if I could make a sponsorship deal with a smartwatch brand to provide free high-quality devices to her group members. Since the university I am affiliated with in Turkey was founded by Turkey’s largest conglomerate, Ayşe thinks that I have enough connections with brands to seal a smartwatch deal.

In addition to the data collected, the sustainability of the self-tracking devices determined by the income groups for which they are designed becomes a marker of the type of physical activity that they can “sense.” The difficulty of quantifying housework with cheaper self-tracking technologies culminates in revelations expressed in performative critiques by lower-class women whose physical activities include both exercise and housework. The revelations gain a performative character as they reside in the very act of *not* being able to sustain the self-tracking wristbands that are *not* water resistant. In other words, frequently impaired wristbands raise a critique by showing the centrality of housework in women’s lives that requires them to come into contact with water. In so far as quantifying housework with cheaper sensing technology is a challenge for lower-class women, it also highlights how class position can disrupt the very ability of self-tracking technologies to transform embodied knowledge into

quantified data. Whereas numbers unite women from all class backgrounds under the revelation that labor at home is demanding, different purchasing power depending on class position may inform the type of critique they raise from using self-tracking devices.

## Conclusion

Andrejevic and Burdon (2015) define “sensor society” through emerging practices of data collection employed by new sensing devices. Sensors refer to a passive mode of information collection as they are “always on.” Their monitoring capacities are “not exercised upon a particular individual per se but upon a specific dimension or register of activity” such as reading speed, music played nearby, or viewing habits (Andrejevic & Burdon, 2015, p. 24). Sensing “devices developed for one purpose generate information that can be repurposed indefinitely” in the sense that “the scanners that allow cashiers to enter prices . . . can also be used to track the speed at which employees work” (Andrejevic & Burdon, 2015, p. 20). Examining “sensor society,” Andrejevic and Burdon conclude, requires us to understand how these new data collection processes culminate in a massive aggregate of (big) data that transforms notions of privacy, surveillance, and sense-making.

By ethnographically exploring the revelations built around self-tracking numbers, I suggest that the features that define the massive data collected by sensors also apply to scattered “personal digital data” (Lupton, 2016) that people see on their screens. Revelations emerge in part because self-tracking devices *passively* collect information about women’s physical movement—a *specific dimension of an activity*—not only when they exercise but also when they complete daily chores at home. Although women start wearing these devices to monitor health and fitness, they *repurpose* the self-tracking numbers to make sense of and to put in words what they implicitly know, that is, work from home is as arduous, time-consuming, and productivity-oriented as work at designated workplaces. Understanding “sensor society,” therefore, requires us to explore not only the top-down monitoring capacities of sensing devices that create massive data aggregates—as highlighted by Andrejevic and Burdon and others (Nafus & Sherman, 2014)—but also bottom-up ways people creatively invent to make sense of newly available numbers about their bodily movements. Just as corporations use sensors to monitor practices for the purpose of, for example, surveillance, individuals may use these numbers to quantify inequalities that marginalize them.

As a term aiming to capture quotidian ways of engaging with sensor data, revelations also shift the focus away from “quantified selves” (Lupton, 2016) to moments of otherwise that may or may not contribute to the reproduction of normative selves, such as “profitable” or productive subjectivities. Revelations are moments of otherwise that are incomplete, transient, and yet have the potential to disturb quantification that creates neoliberal selves since they are alternative ways of making sense of the numbers. In so far as women share their self-tracking numbers on Instagram to prove their productivity, they contribute to the neoliberal image of the home as a space of productivity. However, these numbers also quantify and put on display women’s labor at home, which typically remains invisible due to the newly redrawn boundaries between home and workplace under neoliberal digital capitalism. Revelations, therefore, capture such moments that *quantify the self* in

alternative ways, potentially contesting inequalities created by the gendered division of labor. These are moments of “self-disclosure” (Ruppel et al., 2017) in computer-mediated communication that do not necessarily aim “to organize, coordinate and communicate about collective action to achieve social change” (Priante et al., 2018, p. 2649) although they might promote social change. Revelations built around numbers are simply windows into what remains hidden and what is possible in an alternative order.

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## Supplementary material

Supplementary material is available at *Journal of Computer-Mediated Communication* online.

## Data availability

The author confirms that the data supporting the findings of this study are available within the article and its [supplementary materials](#).

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## References

- Abidin, C. (2018). *Internet celebrity: Understanding fame online*. Emerald Publishing. <https://doi.org/10.1108/9781787560765>
- Andrejevic, M., & Burdon, M. (2015). Defining the sensor society. *Television & New Media*, 16(1), 19–36. <https://doi.org/10.1177/1527476414541552>
- Bishop, S. (2019). Managing visibility on YouTube through algorithmic gossip. *New Media & Society*, 21(11–12), 2589–2606. <https://doi.org/10.1177/1461444819854731>
- Bulut, E. (2020). *A precarious game: The illusion of dream jobs in the video game industry*. Cornell University Press.
- Chess, S. (2018). A time for play: Interstitial time, invest/express games, and feminine leisure style. *New Media & Society*, 20(1), 105–121. <https://doi.org/10.1177/1461444816660729>
- Cotter, K. (2019). Playing the visibility game: How digital influencers and algorithms negotiate influence on Instagram. *New Media & Society*, 21(4), 895–913. <https://doi.org/10.1177/1461444818815684>
- Deleuze, G., & Guattari, F. (1987). *A thousand plateaus: Capitalism and schizophrenia*. The University of Minnesota Press.
- Dixon-Román, E. J. (2016). Diffractive possibilities: Cultural studies and quantification. *Transforming Anthropology*, 24(2), 157–167. <https://doi.org/10.1111/traa.12074>
- Duffy, B. E., Pinch, A., Sannon, S., & Sawey, M. (2021). The nested precarities of creative labor on social media. *Social Media + Society*, 1–12. <https://doi.org/10.1177/20563051211021368>
- Duffy B. E., & Pruchniewska, U. (2017). Gender and self-enterprise in the social media age: A digital double bind. *Information,*

- Communication & Society*, 20(6): 843–859. <https://doi.org/10.1080/1369118X.2017.1291703>.
- Federici, S. (2012). *Revolution at point zero: Housework, reproduction and feminist struggle*. PM Press.
- Fortunati, L. (1995). *The arcane of reproduction: Housework, prostitution, labor and capital*. Autonomedia.
- Foucault, M. (2004). *Security, territory, population: Lectures at the Collège de France 1977–1978*. Palgrave.
- Harvey, D. (2005). *A brief history of neoliberalism*. Oxford University Press.
- Harvey, A. (2018). The fame game: Working your way up the celebrity ladder in Kim Kardashian: Hollywood. *Games and Culture*, 13(7): 652–670. <https://doi.org/10.1177/1555412018757872>
- Humphrey, D. (2022). Sensing the human: Biometric surveillance and the Japanese technology industry. *Media, Culture & Society*, 44(1), 72–87. <https://doi.org/10.1177/01634437211036996>
- Jarrett, K. (2016). *Feminism, labour and digital media: The digital housewife*. Routledge.
- Kim, D. O. (2021). “Pay for your choices”: Deconstructing neoliberal choice through free-to-play mobile interactive fiction games. *New Media & Society*, 1–20. <https://doi.org/10.1177/14614448211018177>
- Klauser, F., & Albrechtslund, A. (2014). From self-tracking to smart urban infrastructures: Towards an interdisciplinary research agenda on big data. *Surveillance & Society*, 12(2), 273–286. <https://doi.org/10.24908/ss.v12i2.4605>
- LiKimWa, R. (2012). *MoodScope: Building a mood sensor from smartphone usage patterns* [Doctoral dissertation]. Rice University.
- Lukacs, G. (2020). *Invisibility by design: Women and labor in Japan’s digital economy*. Duke University Press.
- Lupton, D. (2016). *The quantified self: A sociology of self-tracking*. Polity Press.
- Marazzi, C. (2011). *Capital and affects: The politics of the language economy*. Semiotext(e).
- McEwen, K. D. (2017). Self-tracking practices and digital (re)productive labour. *Philosophy & Technology*, (31), 235–251. <https://doi.org/10.1007/s13347-017-0282-2>
- Nafus, D. & Sherman, J. (2014). This one does not go up to 11: The quantified self movement as an alternative big data practice. *International Journal of Communication*, 8, 1785–1794.
- O’Meara, V. (2019). Weapons of the chic: Instagram influencer engagement pods as practices of resistance to Instagram platform labor. *Social Media + Society*, 5(4), 1–11. <https://doi.org/10.1177/2056305119879671>
- Povinelli E. (2011) *Economies of abandonment: Social belonging and endurance in late liberalism*. Duke University Press.
- Priante, A., Ehrenhard, M. L., van den Broek, T., & Need, A. (2018). Identity and collective action via computer-mediated communication: A review and agenda for future research. *New Media & Society*, 20(7) 2647–2669. <https://doi.org/10.1177/1461444817744783>
- Ruckenstein, M. (2014). Visualized and interacted life: Personal analytics and engagements with data doubles. *Societies*, 4(1), 68–84. <https://doi.org/10.3390/soc4010068>
- Ruppel, E. K., Gross, C., Stoll A., Peck, B. S., Allen, M. & Kim, S. (2017). Reflecting on connecting: Meta-analysis of differences between computer-mediated and face-to-face self-disclosure. *Journal of Computer-Mediated Communication*, 22, 18–34. <https://doi.org/10.1111/jcc4.12179>
- Terranova, T. (2014). Red stack attack! Algorithms, capital, and the automation of the common. In R. Mackay & A. Avanesian (Eds.), *Accelerate: The accelerationist reader* (pp. 281–299). Urbanomic.
- Weeks, K. (2011). *The problem with work: Feminism, Marxism, anti-work politics, and postwork imaginaries*. Duke University Press.
- Wilson J. A. & Yochim E. C. (2017). *Mothering through precarity: Women’s work and digital media*. Duke University Press.
- Winiiecki, D. J. (2007). Subjects, subjectivity, and subjectification in call center work: The doing of doings. *Journal of Contemporary Ethnography*, 36(4), 351–377. <https://doi.org/10.1177/0891241606293141>
- Yaman, M. (2020). Karşılıksız ev içi emek: Teorik ve politik tartışmaların izini sürmek. In F. Saygılıgil & N. Berber (Eds.), *Modern Türkiye’de siyasi düşünce: Feminizm*. İletişim Yayınevi.
- Zuboff, S. (1988). *In the age of the smart machine: The future of work and power*. Basic Books.