CATALYST
feminism, theory, technoscience

Tracking Work from the Wrist: The Surveillance of Ethiopian Women Athletes for Capital

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Abstract

This essay explores the proliferating uses of GPS watches among women athletes in Ethiopia. Aspiring and successful long-distance runners have been using GPS watches in increasing numbers over the past several years, rendering their training trackable for themselves, partners, coaches, sponsors, and agents located in the Global North. This essay explores how the transnational dimensions of the athletics industry renders their training data profitable to systems of capitalist accumulation while exploring how athletes put the emerging technologies to work to aid in their pursuit of succeeding in the sport and work of running.

New Metrics

In 2013, when I was first living with young sub-elite athletes at a training camp in Ethiopia, nearly all runners wore basic digital watches. Casio was the leading brand, but any watch that had a time setting, a few alarms, and, crucially, the start-stop function, was a critical instrument for long-distance running aspirants. Watches that could record splits—different intervals of training—were coveted, but by no means the norm. Thus, the metric that everyone used to discuss training was time. Recovery runs were spoken about in terms of hours run: "one-

Borenstein, Hannah. 2021. "Tracking Work from the Wrist: Surveillance of Ethiopian Women Athletes for Capital." *Catalyst: Feminism, Theory, Technoscience* 7 (1): 1–20.
http://www.catalystjournal.org | ISSN: 2380-3312
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twenty." Speed sessions were broken down into minutes: "we did three minutes by eight with sixty seconds rest." Athletes knew that this would need to be converted to kilometers for their performances, but conversations about training were discussed in terms of time.

By 2016 noticeable changes occurred. Significantly more athletes had acquired GPS watches that could track distance, time, and elevation. At first, international managers started to gift them to younger athletes, who they wanted to lure to their agencies, on their bi-annual visits to Ethiopia. Then, an internal economy around watches emerged; after getting meager prize winnings in early international competitions, some bought them abroad with their earnings. Those who were not at the level of international competition but could scrape together enough funds for a basic smart watch might ask a friend to bring one back from abroad. More recently, watches that offer metrics like heart rate, cadence, stride length, ground contact time, elevation gain, balance, and more have been creeping their way onto the wrists of Ethiopian athletes.

Most athletes cite the influx of watches as a positive development because they can now better monitor their training; however, it is not only the athletes monitoring their work with these watches. In Ethiopia, where successful athletes' salaries and race earnings support families, coaches, and friends, and produce value for shoe and apparel corporations, many have a vested interest in what the watch shows on a regular basis. As a result, a number of actors track the data on these watches—from sports scientists analyzing the data in labs in the United States, to coaches following progression in Ethiopia, to husbands supporting their wives at home —imbuing both the material objects, and what they have the potential to indicate, with multiple valences of value.

As feminist technoscience and science and technology studies (STS) scholars have pointed out, scientific studies, knowledges, and instruments, must be located and understood in their historical, cultural, and political contexts (Haraway 1988; Subramaniam and Wiley 2017). Biotechnological research and data are born from colonial, racist, and sexist material legacies and often commodified for capital gain (Bhattarai 2017; Giordano 2017), and must never be understood as "neutral" in any iteration. To counteract the epistemic hegemony of scientific research and profit, this essay draws on participant observation and interviews with women athletes in Ethiopia to understand how they reconfigure these tracking devices to suit their own needs, within the exploitative structures pervasive in the transnational athletics market.

The changes in measurement from the GPS watches have introduced alterations to the work of running in Ethiopia. At first glance, these watches seem to provide a key function for athletes to track and monitor their own work—including them under the umbrella of *self*-tracking devices. But the introduction of watches has unintended effects; it also enables an array of actors to participate in monitoring their sporting labor. As such, this also gives other actors the grounds to make claims over their work and value. Thus, in this essay I ask, how are conceptions of the body thought about, discussed, and acted upon through monitored movement, among these actors? In what ways do these discourses elucidate the plurality of ways the watches are being put to work? And how are women athletes using these watches in ways that reconfigure notions of their work and value?

Ethnographic research exploring how Ethiopian women[1] long-distance runners work in a transnational athletics market expands notions of what a "self-tracking" device might mean in different contexts and for different people. Questioning *who* is tracking *what*, and *for what ends* offers important critiques of the gendered and racialized production of speed, time, bodily movement, and bioscientific research evolving in new arrangements. Just as athletes reconfigure emergent technologies to aid in their own pursuit of accruing value and change the embodied experiences of training, the watches also render the labor of Ethiopian athletes available to transnational systems of capital accumulation.

Sporting Science: Racist, Sexist, Colonial Legacies

Although many people now associate Ethiopia with its long roster of world-class long-distance runners, the history of Ethiopian athletic excellence engages deeply racialized discourses of science and the body that have been reproduced by the media and scientific studies. Ethiopian men began succeeding on the world stage in the 1960s, beginning with Abebe Bikila's Olympic victory in Rome. Two Olympic cycles later, the majority of distance events were won by Ethiopian and Kenyan men at the 1968 Mexico City Games. The question as to "why" East Africans were so good at running then flooded scientific and cultural arenas; for decades to follow, there was a proliferation of pseudo-scientific theories about East African genetic advantage (Vancini et al. 2014) and the magical benefits of living at altitude (Hamilton 2000). These studies were teleologically oriented to a broader global narrative that situated Black athletes as embodying "natural" advantages (Carrington 2010; Hall 1997).

Ethiopian women found their footing in global sport in the early 1990s. After

Derartu Tulu became the first Black African woman to win a gold medal at the Barcelona Olympics in 1992, she inspired young women in Ethiopia to pursue sport. This coincided with an era of researchers profiting from scientific research about African athletic biology and corporations cashing in on a new hyper-commercial era of international sport (Andrews 2009). From the highly successful levels of Olympic champions, to the lower rungs of amateur athletes seeking racing opportunities and meager shoe contracts, many developed a vested stake in Ethiopian women's athletic labor.

Racist, sexist, and colonial legacies have continued to be reformulated through new technologies of testing and analysis in sport often under rubrics of assessing "fairness." The circumstances of South African Caster Semenya is case-in-point here, as her gender being publicly called into question portrayed her participation as her gender being publicly called into question portrayed her participation as toxic to sport and gender, and a racial pathology (Bailey 2016; Jordan-Young and Karkazis 2019).[2] While Semenya's circumstances have rightly garnered the attention of those working at the intersections of feminist technoscience and sport, this essay engages the entanglements of bodies, technologies, labor, and global capitalism that Ethiopian women athletes find themselves trafficking in and around.

An analysis that focuses on monitoring training data through tracking devices—namely, GPS watches—engages feminist technoscience theory as it troubles binary understandings of nature and technology and situates them in networks of transnational production (Haraway 1998). Furthermore, attention to how Ethiopian women use these devices offers new narratives to the range of working conditions of women in the Global South, which are often reduced to being similarly oppressive (Mohanty 1984). As such, this essay is interested less in the fact that Ethiopian women are also using tracking devices, but is invested in understanding the values, relations, and reconfigurations attached to such engagements.

New perspectives are indeed needed when it comes to self-tracking devices. With global revenues of fitness tracking gadgets climbing to $4.29 billion in 2019 (Paxton 2020), it is right that social scientists and humanities scholars have taken up these tools and the range of experiences that they bring about as objects of critical inquiry throughout the past decade. Many cite Deborah Lupton (2014) as leading the way, ostensibly naming the field of "critical digital health studies." Within the fast-growing field, others focus on how self-tracking devices enable new modes self-surveillance (Sanders 2017), techniques of quantifying and measuring the self (Moore 2015; Lupton 2013), and how the data generated by

devices is imbued with value to be extracted in a "digital knowledge economy" (Lupton 2012; Till 2014).

While there have been analyses about the gendered experiences of interacting with these devices following the rise of consumer fitness culture (Dworkin and Wachs 2009; Markula 1995; Toffoletti and Thorpe 2018), which has contributed to an increase in digital self-tracking device consumption (Depper and Howe 2017), a great deal of this research and literature presumes a white usership. Further, most research participants are not using these tracking devices for their work, but rather for what they do outside of work.

Michael Crawley's 2018 dissertation about Ethiopian men athletes began to unravel some of these Eurocentric dynamics by engaging the burgeoning use of GPS watches in the East African country, noting that they are *livelihood* devices that require an understanding of communal use of timing technology through which Ethiopian runners contest and draw creatively upon time management (2018, 173). Crawley's argument is formative, and I draw upon it here, but it does not address the ways in which these devices operate differently for women working in sport in Ethiopia, which, despite having overlaps, is a different endeavor.

Thus, the experiences of Ethiopian women athletes remain important not only for unveiling the ways in which surveillance, self-monitoring, and value extraction are currently operating; their perspectives are also important because a failure to attend to complicated entanglements can have damaging implications. Feminist technoscience scholars have astutely pointed out how technological developments can both derive from and actively breed new structural forms of racial, gender, and economic inequality (Benjamin 2019; Braun 2014; Roberts 2011). In Africa, in particular, histories of experimentation on women normalized slavery and reproduced norms for Black women's bodies to be subjected to surveillance, research, and value extraction (Tilley 2011; Wynter 2003). In research about sport, feminist literature has largely focused on the experiences of women in the Global North. Following recent calls to redress these gaps (Toffoleti, Palmer, and Samie 2018) by addressing the perspectives of women in the Global South, in the sections that follow I engage questions central to feminist technoscientific discourse to show how GPS watches are reconfigured by athletes to meet their own needs and desires, while their work is rendered trackable by others interested in accumulating value from their labor.

Tracking from Afar

"I've been using the watch, but the application is not working. Is all the data there?" Hiwot asks.[3] She seems nervous to hear the answer to her question, but before translating her question for the Sport developer, I ask her about her anxieties for clarification.

"Do you mean for you? Or for Sport?"

"Both," she says. "It's been a long time since I have been able to upload the data."

In December 2019, we were in the Addis Ababa office of the sports agency that represents Hiwot. I was doing fieldwork with this particular group, which has a training program made up of many tiers of athletes—shoe-contracted athletes, agency-contracted athletes (an informal agreement for athletes not yet good enough for a contract but on their way), and a development group of amateur athletes who have been recruited from regional clubs and have settled in the capital city looking to move up in the ranks. Usually, fieldwork consisted of attending early morning trainings with athletes, spending time in the office for meetings, or attending social gatherings at their homes and in cafés talking about their experiences working in athletics. On this particular occasion, I volunteered to serve as interpreter between elite contracted athletes and the Sport representatives who were traveling the continent doing product testing.

I tell the Sport developer that Hiwot has not been able to see the data, and I gather that she is anxious about whether or not the watch is working. The Sport developer asks me how long Hiwot has not been able to upload the data. "How long has it been?" I ask.

"A long time," she says, and I translate.

"What is a long time?" the Sport developer inquires, seemingly frustrated at the vague time frame given in the first place. "Five days, five weeks, five months?"

I translate and Hiwot replies, "Right before Spain." This was the competition where she won the marathon and set the course record in a blistering time well under two hours, twenty minutes. The Sport developer looks down and rapidly scrolls through the watch in her right hand, while simultaneously navigating an application on Hiwot's Samsung phone in the other.

"Are *they* receiving the data?" Hiwot asks. I translate.

"No," the Sport developer says. This is a word Hiwot understands clearly. Tears quickly accumulate in her eyes.

I ask the Sport developer to clarify. "It's not there now, but the data is in the watch, correct? So we can transfer retroactively?"

"Yeah," she says casually, still looking down at the devices. "We just need to figure out how to sync the app and the watch."

I tell Hiwot, but she asks me again, as we wait for the next ten minutes to re-install the application and begin the re-sync, whether or not the data is retrievable for *them*—the sports scientists in the Pacific Northwest.

Though Hiwot's work occurs in meadows, mountains, and dirt roads on the outskirts of Addis Ababa, scientists working at the Sport Research Lab still monitor her efforts in the United States. They can see the routes that she runs, the paces that she runs at, the altitude of the training, and her heart rate as the training progresses.

While the Garmin watch is marketed online by telling potential buyers the metrics allow users to "evaluate your recent exercise history and performance indicators to let you know if you're training productively peaking or overreaching," the Garmin watch that Hiwot wears lets *others* know about her "performance indicators" (Garmin, n.d.). With access to the data on Hiwot's watch, the Sport scientists can monitor her "motor"—a word to historically measure the energy of both workers and athletes in the fields work physiology and sports science.[4]

In surveilling and maximizing the "motors" of athletes, these metrics appear to offer advantage. The domineering metric of time, for instance—its appearance of objectivity and the reality that a hundredth of a second can be the difference between tens of thousands in prize money or a signature on a contract—means athletes and various stakeholders constantly worry about their recorded times (Finn 2016). Like some other metrics, time becomes a way of providing evidence for improvement and negotiating sponsorship deals.

Hiwot, then, *wants* Sport researchers to see this data—to be able to track her training both so they can give her advice on how to maximize her potential and

witness her ongoing improvement. After about ten minutes of the Sport developer playing with Hiwot's phone and her watch, she looks more pleased.

"Ok, so it looks like we finally got the data to start syncing."

A wave of relief washes over Hiwot's face.

"Should we go over how to use the watch again?" the Sport developer asks. Hiwot nods and they both look at the devices, "So, again, here is how you track your runs. I see you have it set to miles. Kilometers is probably better?"

Hiwot agrees.

This is the latest Garmin watch, which means that it tracks, to the highest level of accuracy, live splits (meaning Hiwot can monitor her pace at each step), kilometers, altitude, elevation gain, and so on. She is also told to continue wearing an arm band, which records accurate heart rate, so the scientists can evaluate how much energy she is expending for the given time-distance metrics.

The Sport developer then turns to me, "Tell her she can look at all of this only if she wants, but she doesn't have to. It's really for the scientists to see."

I translate, then ask curiously, "Do you have interest?"

She shrugs, then asks me how long it will take the data to load.

"Probably a few hours at the rate it is going," I speculate.

"Ok. I need to go for training in one hour," she mentions.

"If it's not finished loading, you can maybe train without the watch this afternoon," the Sport developer advises, making an exception this time.

The Sport developer does not expect the watch to be put to work here as a *self*-tracking device. That "It's really for the scientists to see" indicates how the value of Hiwot's labor is viewed. Her data, as seen from Sport's perspective, is readily extractable for the scientists and marketers working through the corporation. Not only is her body and data seen as valuable for research knowledge; they are seen as Sport's property.

Although Ethiopia was never colonized, attending to postcolonial studies of STS helps to locate the broader geopolitical context in which Ethiopian women are subjected to uneven flows of global capital while they adapt technologies to their own ends. It is not only that colonial ideologies and practices are “rephrased” within technoscientific frameworks of athletic globalization (Anderson and Adams 2008; Pollock and Subramaniam 2016). Even as private corporations in the United States presume ownership over the bodies and information of African women and their labor, the watches as they are embedded in material realities show that they are not always taken up in the ways intended by their designers. Within these frictions and contestations, we must explore how the watches given to Ethiopian women allow for new sights of profit extraction rooted in colonial ideologies, but also present new possibilities for using technologies for ulterior purposes.

Later that afternoon, Hiwot traveled up to Sululta, Ethiopia, where she lives at an altitude of nearly 2,900 meters and ran ten kilometers. She left the management office to zigzag between eucalyptus trees for about forty-five minutes and do some plyometric exercises (a dynamic stretching routine known colloquially as “gymnastics” in Ethiopia), strengthening specific muscles and tendons required to be an elite runner.

But as Hiwot enters her athletic prime, she is not only worried about managing her time in training runs; she is also concerned about monitoring the time of her career in the athletics industry. She met her husband through sport, but a consistent trail of injuries led him to drop out and become her full-time support. He has been investing some of her prize monies into unrelated business ventures, new cars, and extensions to their house. Thus, she knows that the rhythms of her work are crucial for their collective success.

Hiwot repurposes the watch to also track the timing of her menstrual cycle and see how it affects her performance, and to consider when having children might be possible. Along with other women athletes, she often forecasts a hypothetically good time to have children: “If I run really well in [insert race] and then immediately get pregnant, I will have enough money to support the child for a while before starting training again. It would be better to wait to have children until my career is over, but then I’ll be too old.” These pressures pervade Hiwot’s training schedule. She knows that, when it comes to starting a family, the clock is ticking.

Thus, while Sport tracks her training cycles to understand the conditions in which her body can excel, no one consults Hiwot about the ways this changes the relationship to her body, or those around her. But she tracks this data in conjunction with receiving reports from Sport about how to maximize her value. Despite the fact that they do not inquire about the hope for future maternal labor, she incorporates this data accumulation in new ways to orient toward her own values.

Tracking Up Close

"Three hundred fifty calories," Tigist says, concluding a very easy forty-minute jog the day before a competition. "*Tefa.*" They have disappeared.

"Two days ago," comparing energy expenditure, she says, "one hour and intervals, nine hundred calories."

Though he is not present the day of the competition, Wendesh—her husband and coach—also looks at the watch sometimes. He explores the metrics alongside her. Sometimes he sees all the calories she has expended and urges her to eat more. Other times, he cautions her to not eat too much, emphasizing the importance of maintaining a low body weight. There are many ways she and her husband use the watch together.

These collective uses might be missed if we only viewed these GPS watches as self-tracking devices. For example, in the case of Tigist and Wendesh's relationship, this technology produces new types of gendered (and in this case, spousal) surveillance that tread familiar lines of weight management that can lead to deleterious health effects (under-fueling, eating disorders, etc.). However, Tigist's running is seen to be a collective endeavor, and she views success in the industry as dependent on both her and her husband's efforts. This is one of the ways in which the users of these wearable devices reinvent them to become collective instruments for betterment.

As Nelly Oudshoorn and Trevor Pinch (2003) note, "Users of technology do not arrive de novo" (2). Rather, they bring their own desires, strategies, and responses to their interactions with technologies, despite the fact that the introduction of certain devices may be installed with the goal of capital accumulation. Further, the GPS watches are not simply co-constructed by the producer and the consumer; social relations also change around the technologies as well. Understanding consumption as part of the production process by centering the

user (Lie and Sørenson 1996) allows a reading that centers the effects capital accumulation on the users, rather than just focusing on their own self-surveillance and its conditioning.

However, a simultaneous engagement with the multitude of ways people use the technologies created by engineers might show how the predominance of a self-tracking regime can shift to something more complex (Rapp 1998). As Tigist and Wendesh are active participants using the watch, the dynamics of their relationship transform. The technology gets integrated into daily life, and the ways they adjust it to training both feeds back into the technological industry and changes the values of the household and their relationship (Silverstone and Hirsch 1993).

Tigist and Wendesh both grew up in Bahir Dar, in northern Ethiopia, but met after joining a government club in Addis Ababa. Tigist had just finished grade six and made the difficult decision to leave a single-mothered family of eight to pursue a sporting career. At training camp their relationship blossomed. However, as Wendesh faced consistent problems with his Achilles tendon, Tigist was thriving. After she signed her first agency contract, Wendesh shifted his efforts from being an athlete to a coach and husband, and the two married. Thereafter, Wendesh shifted his motivations to making sure Tigist could focus solely on training.

Athletes in Ethiopia rise to the top from a range of circumstances, but Tigist's trajectory is considerably familiar. Most athletes are not from the city, but go to Addis Ababa to professionalize, and the vast majority of women end up in relationships with current and former runners. These trajectories mean that the shifting opportunities in labor for women also shift labor relations for men. As men sometimes end up as the caregivers of female athletes, their work reshapes typical conventions of gendered divisions of labor. In an era in which male working-class jobs have declined worldwide, and development programs have been oriented to uplifting women, "an analysis of gender therefore must take into consideration the different ways in which men seek to establish their masculinity if they cannot do it through production" (Ray 2018, 58). Wendesh's work, not named as productive, then helps to form an analysis of the gendered relations of labor and production in an era of neoliberal globalization.

"When people see the athletes win on TV, they think it is easy," Wendesh noted. "But I wake up early, take her to training. Sometimes I sleep in the car if she runs easy. I used to run with her but now I can't. Then I take her back to the house,

make sure she has proper food. When she sleeps, I clean the house. It's a full-time job."

With the exception of a few top-level women athletes who employ additional domestic help, Wendesh, and husbands like him, sometimes take over the work characteristically seen as women's work in order for his wife to succeed. Although earlier feminists needed to politicize the ways in which this housework is central to reproducing the labor power in capitalist production cycles (Federici 1975; Davis 1983; Bhattacharya 2017), little has been written of men who take on these gendered tasks. But athletes' husbands view their unwaged labor in a similar vein: real work crucial to the value production process.

Thus, when Tigist got her first GPS watch, it was not viewed merely as her own and it gave rise to new and more precise forms of monitoring her movements. Tigist's husband embraced the technology with the hopes of transforming and enhancing her training and recovery. Now it means he does not need to go monitor her training runs in person; he can track the training in new ways. He can take a more "scientific" approach to her training.

The discourse of embracing "science" in sport and being more "scientific" was something that burgeoned in Ethiopia alongside the proliferation of new technological devices. Beginning around 2016, I began hearing from nearly all coaches that they were in "sports science" programs or intending to enroll as soon as possible. The ability to embrace science was seen as taking advantage of an expertise that had long been elsewhere, especially the United States and Europe.

This discussion runs counter to Eurocentric conceptions of advantage in international sport. As noted earlier, African athletic excellence is often attributed to unfair advantage. In previous decades, these suspicions stemmed from "natural" and "environmental" conditions, but in recent years, the speculative use of illegal performance-enhancing drugs has similarly called into question the "fairness" and "purity" of African competitors. As a result, technologies deployed by international governing regimes from the Global North have centered around detecting this kind of artificial enhancement.[5] In both instances, the rhetoric has shifted ever slightly to reproduce racist, sexist, and colonial legacies of ideas about morality and duplicity that reframe the importance of actors from the Global North as rule makers and actors from the Global South as deviators.

The ways Tigist and Wendesh see the device inverts this Eurocentric discourse.

Her husband's ability to use more scientific methods narrows the fairness gap and augments a perceived European scientific advantage. "It's good. Really good," Tigist noted. "A lot of athletes do not know how to use all the functions, but Wendesh has learned more about calories and heart rate and everything," she says, directly referencing how she values his work using the device. It adds dynamics to *his* work as a husband and a coach, but they have embraced how it changes their respective roles.

Although watches introduce anxieties about constant surveillance, using them as collective working devices can actually alleviate some of the quotidian anxieties that come with being a professional athlete. Displacing some of the concerns about balancing caloric intake, energy expenditure, and recovery to the role of her husband and coach, Tigist benefits from reduced stress and a sense that she is able to take advantage of technologies and information that have been readily available to athletes in the Global North. Even though Wendesh's work may be undervalued in the overall production process, the ways the technology has been transformed their work is viewed positively.

Tracking and Feeling

Not all women have seen the positive developments through tracking devices like Tigist, but it was harder to come by the more negative experiences. This might be because sharing these stories would implicate others negatively, but also because they were not always wholly harmful. Understanding that "the political struggle is to see from both perspectives at once" (Haraway 1991, 154), we can read the ways in which these devices provide not only new configurations for using the device but new feelings of embodiment, even as they remain embedded in exploitative structures of capitalist accumulation.

When I asked one athlete, Eden, about her watch, she enthusiastically told me about how much the watch had improved her training:

> You can imagine how much better you feel now, both physically but also mentally. The day after a hard training session, you might feel so tired, and maybe you go ten kilometers or fourteen kilometers in one hour, but you have no idea. Now, maybe I think my legs feel tired sometimes, but I look at my watch, and I see I'm going fast but it feels easy. So I'm happy. Other times maybe you should feel better but you see you are going to slow. Then you can think about why you are tired. Maybe you need more sleep or food. Or maybe then you decide not to work in the afternoon and take a rest.

Eden's connection to her watch—physically, mentally, and emotionally—underscores a multifaceted attachment. Often the depiction of high-tech wearables becoming deeply embedded in our lives elicits a conception of a machinic existence. However, as Donna Haraway (1991) made clear in "A Cyborg Manifesto," this is a flawed and fabricated distinction and only reifies problematic dualisms. Eden's watch and its metrics actually allow her to feel *more* in touch with her body.

However, the material history of her watch also symbolizes fraught dynamics in Eden's life and that of the training group. When the Garmin watch was initially gifted to Eden by a sports marketing employee from Sport, it was worn at first *not* on her wrist—but that of her husband. She brought it home from training and her husband, a runner of a far lower caliber than her, took it for himself.

"This was before watches were the norm," a friend of hers told me, "and so he wanted to look rich." On a subsequent visit, the head of Sport sports marketing saw that he had taken it, and angrily scolded her husband for stealing the gift meant to enhance his wife's work as he donned it on his body for performative modernity. The confrontation eventually resulted in the watch being returned to Eden, who became the primary user of the device. But the initial cooptation gives rise to the importance of gendered experiences with the gifts and usages of these wearables. The data, were it being used or tracked for a burgeoning digital labor economy, might be inaccurately tracking the movements and work not of Eden but her husband.

The fact that Eden's data—not necessarily her own movements—were being tracked, and that I heard this as a nugget of gossip from a friend, points to a possible range of uncited anecdotes of the experiences of women athletes—especially, as I heard about Eden and other women athletes, that their husbands were not particularly supportive of them as wives but "only as workers." There were often conceptions about men marrying women to "make them work," earn a lot of money abroad, and profit from their wives' labors.

Regardless of whether or not the Sport employee was personally impacted by this reality, the main justification for the watch's return was that it was "not being put to appropriate use." Further, detecting its misappropriation enabled new sights of tracking—to the inside dynamics of Eden's relationship with her husband. Crucially, this is why we must continue to push our understanding of these devices

as tracking far more than only the self. Even as Eden ultimately benefited from the device's acquisition in both her work and sense of embodiment, the Sport representative, well-intentioned as he may have been, was driven by capital gain.

Tracking Accumulation

The experiences I incorporate into this analysis bring critical attention to gaps in the existing literature about self-tracking devices to explore how Ethiopian women can repurpose technologies to their own ends, even existing within exploitative structures of capital accumulation. At the same time, it also shows how other users—at times to their delight and at other times to their chagrin—embed themselves in these new technologies. There are ways in which women athletes embrace new technologies, and, at times, even *want* to be monitored. Linking them together is their work in a transnational athletics market, through which they look to make money with and for their social networks. These GPS technologies are not simply consumerist domains, but indeed play a role in developing the potential to provide some a way out of poverty. However, the conditions that drive these women into this precarious work get reproduced through these forms of surveillance and data extraction that benefit capital accumulation.

While GPS watches—elsewhere written about as self-tracking devices—usher in new forms of self-surveillance and contribute to a rise in value production in the digital labor economy, for Ethiopian athletes they are tracking devices writ large—for their coaches, employers, husbands, and others. They extract value not only in the ways that they produce digital information for corporations in charge of these watches, but also in the ways they employ historically situated strategies of worker physiology, energy management, and productivity, for the benefit of a ruling class.

Rather than the self-tracking devices that feminist scholars of STS have written about that usher in Foucauldian forms of self-surveillance, these devices indeed incorporate a network of people and entities. Turning toward postcolonial feminist approaches in STS and broadening the global and racial scope of ethnography in feminist studies of sport, the experiences of Ethiopian women athletes show that these devices, even as they reconfigure feelings of training and embodiment in positive ways, can still be sheltered under the umbrella of the gendered control of speed, time, and bodily movement that capital accumulation is dependent upon.

These watches not only transform the work of women athletes, but they also transform the work and relations that women embody through their pursuit. They shed light on how capital expects the devices to be put to use for value accumulation; how husbands, coaches, and agents want them to be incorporated into training regimes; and how women can relate to their own embodied training, as well as the gendered divisions in athletic labor. They are indeed *tracking* devices, though not only of the self; but moreover, they are *working* devices with different gendered, racialized, and classed implications in their multivalent usages.

Notes

[1] In this essay I do not problematize categorical distinctions between women and men in the way that they often should be. This is in large part because the people I lived with and interviewed see these categories as distinct, especially in athletics. Because this analysis is also centered around conceptions of work, and the work of athletics is classified and distinguished between somewhat archaic conceptions of gender, I use and think through these categories as people discuss them in my fieldwork.

[2] Semenya began enduring incredibly invasive and dehumanizing gender testing protocols following her victory at the 2009 World Championships. Governing bodies in track and field and the Olympics launched a nearly decade-long investigation as to whether or not Semenya's participation was "fair." The Court of Arbitration for Sport issued a ruling in 2018 that bars Semenya from competing in middle distance events, as well as other women with "exceptionally high testosterone levels," despite several researchers calling into question not only the ethics but the validity of the science underlying such decisions (Jordan-Young and Karkazis 2019).

[3] All names of people and companies used are pseudonyms.

[4] The language used by scientists and corporate employees derive from long histories of workplace tracking. For purposes here, it's important to note that nineteenth-century physiologists and scientists researched energy maintenance with the hopes of eliminating fatigue—the "permanent nemesis of an industrializing Europe" (Rabinbach 1992, 4). A dramatic increase in studies of fatigue at turn of the century focused on muscle fatigue, nervous exhaustion, brain exhaustion occurred alongside the growth of a commercial economy based on chronological clock time and temporal tracking instruments in which "time

[was] currency—it is not passed but spent" (Thompson 1967, 61). Thus, as the convergence of time-space perception coincided with new ideas about fatigue, human movement began to be understood as machinic—something that needed rest and recovery—but could be trained to work in incredibly effective ways to maximize productivity. Sport, and specifically running, became a central way of exploring this new science of work. Apparatuses to measure running with the goal of "maximizing the economy of the body" later saw high-performance athletes as ideal figures to observe how energy efficiency could be measured and maximized (Rabinbach 1992, 119).

[5] The World Anti-Doping Association has situated itself as leading the way "cleaning up sport" as a moral crusade. Kathryn Henne (2015) has elucidated how this has led to a discourse about "athlete citizenship" in which athletes are subjected to biomedical surveillance to evaluate their "purity" if they are allowed to be a part of this community. However, Henne's research shows how aesthetic judgments, postcolonial ideologies about purity, and trust in scientific testing mean that the technologies used to police this citizenship are embedded in racist and postcolonial ideologies.

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