Wearable Technology: The Rise of Personalized Technology in Obesity Care

A Research Paper submitted to the Department of Engineering and Society

Presented to the Faculty of the School of Engineering and Applied Science
University of Virginia • Charlottesville, Virginia

In Partial Fulfillment of the Requirements for the Degree
Bachelor of Science, School of Engineering

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Spring 2025

On my honor as a University Student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments

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Introduction

Obesity has become one of the most dangerous and widespread problems facing the medical world as we evolve through the 21st century. Heart disease, diabetes, hypertension, and dozens of other diseases that have grown increasingly prevalent can all be traced back to obesity, being influenced directly or indirectly by its presence in an individual. Yet, just as its comorbidities become more commonplace, so too have obesity's treatment methods been diversified. There are three categories of treatment: drugs, dieting, and surgery. Each category has its own merits and demerits to consider. Bariatric surgery, for example, is fairly effective at ensuring weight loss, but requires patients to undergo an irreversible change to their gastric system that they will live with for the rest of their lives. Drug treatments, at least those that work, often carry adverse side effects and can even act as carcinogens. The simplest and most effective obesity treatment has always been a change in lifestyle. Consuming less food ensures the body must burn its own fat content to survive, leading to regularly documented success in those capable of maintaining this lifestyle. However, a change in diet is not the only necessary lifestyle change. Regular exercise, in tandem with this healthier eating, is a surefire method to combat obesity. One emergent sector of technology that assists with keeping track of this exercise is called wearable devices.

I will investigate the different socio-technical factors that have led to the sudden rise in popularity of wearable devices in obesity treatment. This emergent technology has become widespread, and I wish to determine why such a spread has occurred while their definitive effectiveness is all but unverified. This will be done by utilizing an Actor-Network Theory framework to determine how the actors involved in their popularization are motivated to do so by external factors and by each other. Possessing a greater understanding of the causes for this

technological sector's growth will allow for drawing conclusions regarding the moral foundation of this growth.

Background and Context

Wearable technology has existed in many forms over the decades, from belts, to even one proposed design of "smart pants", but the most common form comes as a watch. These products gained popularity early in the 2010s with products such as the Fitbit designed to monitor your regular health as well as tell the time. Big tech companies such as Apple, Microsoft, and Google have all capitalized on this trend to iterate similar functions into their own smart watches, which not only record things like heart rate but movement, diet, and even mood. In recent years, several physicians and dieting experts have taken the information provided by these to formulate more personalized care for their obese patients. My research will figure out why this is, by determining what factors have led to the popularization of this emergent technology in obesity care and what motivates the actors in this network to encourage this trend.

Literature

Everyone needs something different in their medical treatment for it to be optimally successful, whether that be in the form of differing doses, shifting timelines, or varying levels of observation. Wearable technology has been around in healthcare for over a decade, growing more prevalent as technology itself evolves and grows to suit the limitless individualism of patient needs. These devices provide accurate, time-relevant data on important aspects of their users' health. The question I seek to answer in my STS research, regarding these devices, is "why?" Why have personal devices grown to such prevalence in obesity care, who stands to gain from their popularity, and what motivates them to popularize it? Many experts in the field have discussed their efficacy, but few have discussed their motivations.

Most of the literature surrounding wearable technology comes in the form of academic reviews, in which scholars assess the quantitative effectiveness of these devices on patients with obesity trying to lose weight. Without wearable technology, it was found that only 20% of weight loss patients maintained a weight deficit over the course of several years (Fawcett, et al., 2020). Many other experts found, however, that on average wearable devices such as smart watches had a net positive impact on patients' weight loss journeys (Cheatham, et al., 2018; Hinchcliffe, et al., 2022; McDonough, et al., 2021). While some have found little evidence of this, they attribute it more to a lack of time that wearable devices have been used in this field leading to a lack of evidence one way or another (Jo, et al., 2019). Physicians rightfully have respect for results, and that respect could help explain one of the reasons that many of them are eager to recommend their usage to patients desiring personalized weight loss programs. Others view this popularity as a broader technological wave, with wearable devices becoming more common in all forms of healthcare (Griewe, et al., 2020). This paints the technology in a different light, that of a passenger to a wider trend rather than a unique movement with direct cause behind it. On the business side of this network, some experts paint the popularity of wearable technology as just as much a corporate tactic to digitize the human experience and devalue our physical sensations in favor of the digitally numerical (Gidaris, 2019). Still others attribute their corporate popularity to the same as any other: there is a growing consumer market for it (Chandel, et al., 2022). These two views are not necessarily mutually exclusive. The corporate side of wearable device production for healthcare is most likely motivated by a desire for increased capital, as corporations tend to be, yet this does not make the growth of their popularity disingenuous. Current experts believe in the efficacy of wearable devices, which motivates physicians to advise their patients to invest in them for their personal care. Manufacturers, seeing this growing

market, rise to meet the demand with a host of products designed to make them money. This is the depth of expert knowledge, and it serves as the bare bones understanding I will build my further research off of.

Theoretical Framework

The theoretical framework of this research utilizes actor-network theory (ANT) to better understand and categorize the different groups that relate to wearable technology's popularization. Using this framework, the implementation of wearable technology in obesity patients can be assessed not as single cases of successes or failures, but as a network of groups that interact and mold each other. As put by Dolwick in his 2009 paper "'the social' and beyond: Introducing actor-network theory", every actor is a network, and every network is an actor. The idea gleaned from this is that this research is not simply about wearable devices, but how the interactions of these patients with the technology has popularized it over time. Not only that, but the designers of the devices, the companies that sell them, the doctors that recommend them, and the patients that use them are all a part of the contemporary network shaping this treatment supplement. A technology designed for myriad purposes and all that engage with it for their own purposes are bound to alter each other mutually.

Methods

The central objective of this research was to find out what factors have led to the popularization of wearable technology in weight loss programs. The best way to find this out was by discerning the different groups involved in this popularization and research what motivates these groups. Motivations could be derived from actions, tendencies, and similar observational traits relevant to these different groups. I required evidence of what these groups are from review articles and evidence of what these groups value from firsthand accounts or other review articles.

Additionally, I used evidence such as weight loss programs, ads for wearable devices, and even earnings reports from relevant companies to paint a more accurate picture of how these groups have impacted wearable device popularity over recent years. I collected this evidence through thorough online research, pouring through related academic sources and creating a comprehensive list of useful, relevant evidence. The first body of work involved acquiring the sources After this stage, all that was left was to determine which passages from the sources depicted evidence for motivations. I ensured that this evidence is authoritative by attempting to determine what counter-arguments could be made using my own evidence and disproving those counter-arguments as adequately as I could with what evidence I found. Analysis of evidence was done through the refinement of my sources for information regarding my topic. More specifically, I intended on finding what my sources have in terms of information on motivations. Not so much "how effective are these products," but "why these products?" I went through my sources and took passages I felt indicated the motivations of involved parties, categorizing them into groups relating to the different actors in my topic's network. This evidence was then synthesized and made a part of the final research paper.

The Manufacturers

As with any product, the manufacturer is the cornerstone of its design, its creation, and its popularity. Without the consumer, though they would have no cause to, the manufacturer could still produce a product. The consumer could not engage with the product if the manufacturer did not provide it. The two are still heavily reliant on each other, particularly in fields such as accessories or, in this case, wearable devices. Despite the importance of the manufacturer, the mixed economies that most first world countries possess to varying degrees place consumer opinion on the forefront of companies' minds. For accessories like smart wearable devices, this

means that their creators design them with different groups of customers in mind in order to maximize their own profit.

One popular technology advice site, Tom's Guide, encapsulates this perfectly in its article titled "Best fitness trackers in 2025: Tested and rated for every budget" by McGuire and Bracaglia. In a fairly detailed account of the current state of this technological subset, the authors discuss the most viable wearable devices for different classes of consumers and which manufacturers appeal best to those groups. For example, the authors reference Fitbit, a company specialized for these watches, as the best overall for any budget. For Apple users, they recommend the Apple Watch 10 due to its easy interfacing with other health apps on its users' iphones. The trackers are almost entirely watches, save for one smart ring called the Oura Ring 4, which implies that these are the most common and successful forms of fitness trackers on the market. The most prominent creators of smart devices, from this article, appear to be major technology companies, like Apple, and companies that specialize in fitness watches, such as Fitbit. The simplest way to investigate the motivations of these companies and how they relate to obesity care is to examine the driving forces behind the products themselves. Moreover, how these driving forces are likely not related to obesity care at all. For the purpose of this argument, Apple will be used as a stand-in for the myriad major technology companies that produce wearable devices, while Fitbit will be used in a similar way to represent specialized fitness companies.

Apple is a technological giant of the modern age, and the company with the largest market cap in the world of 3.273 trillion USD at the time of writing (CompaniesMarketCap, 2025). There are many countries with lower gross domestic product than that value. Apple represents the forefront of technology around the world, and their wearable technology is no

exception. In their earnings report for Q1 of 2025, the company reportedly earned 11.747 billion USD on wearable devices alone, which was over 3 billion dollars more than on the iPad and Mac individually (Inc, 2025). Though this value did not grow year over year, it still represents a clear sign of the success the company has had with their Apple Watch product in recent years. It stands to reason that Apple, as the highest valued company in the world, continues to pursue the success of this product for that very reason. A product that does not sell well, therefore not driving shareholder value upwards, has little value to such an organization. A successful product does.

Fitbit, though different in scope from Apple or Amazon, is still a corporation whose motivations are rooted in generating value, in their case for their parent company Google. That said, there is a world of difference between a company who gets a fraction of their revenue from fitness technology and one whose revenue is made up purely of it. While Apple may have one or two branches dedicated to the Apple Watch and its continued success, the success of the Fitbit product is its company's top priority. For a company like Fitbit, branching out into the business of weight loss programs has the potential to open up a new and lucrative income stream for themselves and for their parent company. This process, seemingly, has already begun. Fitbit released a three-pronged article titled "The Results are In", which demonstrated in third-party, in-house, and a related illness study that long term use of the product could help patients with their weight loss (Fitbit, n.d.). This form of evidence-based marketing could imply that the subsidiary at the very least has considered the use of its product for weight loss specifically, and seeks to capitalize on that market. While still motivated for profit, Fitbit and other smaller companies that specialize in wearable technology appear more heavily invested in the potential of weight loss due to their complete focus on the viability of their products in the fitness sector.

The Prescribers

The medical industry is one of the most important pillars of modern society, and lies at the center of the obesity epidemic afflicting the world at large. Medical technology in particular is a huge field thanks to its unique focus on the health of its users. These devices, from the simple stethoscope to the incredibly expensive MRI, are rigorously vetted with safety testing. Wearable fitness trackers, however, are an exception. Companies such as Apple report that their finer tuned sensors present on their Apple Watches have some mechanisms that are classified as medical devices and some that are not (Scheid, et al., 2023). While their status as medical devices is divisive, there is no doubt that these devices have become more commonplace in dieting and fitness over the past decade.

As mentioned in the introduction, the most common method of obesity treatment recommended is via dieting and exercise, though there exist several schools of thought about how to go about this practice. There are two primary outlets by which the consumer, who often has little to no medical experience, can go about the weight loss process. Obese or otherwise overweight consumers are given fitness and dieting plans by either their physician or by third party weight loss programs. While there is a great difference between the two in alleged credibility, that does not discourage many members of the public from pursuing each in earnest.

Physician-driven weight loss programs are most commonly used for individuals seeking genuine medical attention for their obesity, often individuals who suffer heart attacks or strokes due to the increasing damage that their weight does to their health. In these cases, it is the physician's job to ensure their patient goes from unhealthy to healthy, as that is their job. How do wearable devices fit into this process, and why do physicians advise them? One medical weight loss organization, Valley Bariatric, advocates for wearable devices due to the repetitive,

achievable goals that they provide, specifically citing the Apple Watch (Bariatric, 2025). The group also discusses the myriad ways that weight loss patients can be involved in their own journey, rather than act as merely a patient, thanks to the interactive nature of these watches. This could suggest that physicians advise the use of wearable technology for weight loss patients because it gives the patient agency in their own recovery, and at the same time takes the pressure away from the physician to be completely responsible for this process. While the group did not mention the actual efficacy of using smart watches, many sources of medical literature claim that there is a noticeable positive impact on weight loss experiences with patients who utilize wearable technology (Cheatham, et al., 2018; Hinchcliffe, et al., 2022; McDonough, et al., 2021). For physicians, it could be that the growth of wearable technology in weight loss provides a way to provide less rigorous work for themselves while showing effectiveness in helping their patients get where they want to be with their weight.

Commercial weight loss programs exist in a different league as physician-driven programs, in both scope and in purpose. Many of these programs, with the most prominent being Weight Watchers, are much more dietary practices than fitness programs. They take the information their clients give them, customize a personalized dieting plan for them, and then charge a monthly or yearly fee for the continued use of this diet as the client's needs change. Weight Watchers, which uses an app on iPhone and Android to help their patients track their diet, has implemented technology to allow patients to interface their weight watchers profile with the health app on their iPhone, which takes data directly from any Apple Watch they may own, or even link the app to their Fitbit for the same purpose (BestReviews, 2021). Though these actions are not specifically recommended by the company, they are present for consumers to engage with. This could imply that they and similar commercial weight loss programs have identified

the growing usage of fitness trackers, and seek to capitalize on this popularity via implementation in their personal apps and websites. For these companies, who are often publicly traded, shareholder value is their bottom line; it stands to reason that they would pursue this opportunity for that reason, among others.

The Consumers

The most important group in the discussion of wearable technology in weight loss is, without a doubt, the consumer. Without the consumer there is no data, no reason to create the product, and no popularization of it. According to the American College of Sports Medicine, wearable technology has been at the forefront of consumer fitness products for several years, even ranking first in 2022 and several of the years before (Thompson, 2022). Thanks to their great versatility in exercise, this is no surprise. Individuals with Apple Watches provide continuous health data during the day that they can reflect upon afterwards and plan around for future workouts. The watches can identify the type of exercise, the intensity, and even imbalances in certain properties such as blood oxygen. Weight loss is no exception to this versatility, and consumers appear to agree.

Though the true identities and veracity of most consumers present in online forums is something inaccessible to the public, earnest input from others is the most accurate way to determine why consumers have used wearable devices for weight loss more and more over the years. The general consensus appears to be that, well, they just work. On the website Reddit, a popular online forum site, the subreddit r/WeightLossAdvice is key to providing insight on what some users have experienced using smart watches for their own weight loss journeys. For this analysis, the post “is a smart watch worth it?” was used ([PlsGiveMeKiki], 2023). One user, “jcollar13”, claimed that “Honestly. as much as I hate to say it. Yes. They do so much now…”,

indicating further that the watch keeps him or her motivated towards his or her weight loss goals. Another user by the name of "Miimmoouuu" mentioned that his or her apple watch greatly improved motivation and that any watch, apple or cheaper, is good for that purpose. Also of note is that not a single comment in the thread said anything negative about the watches, aside from that the Apple Watch in particular is too expensive. While not the most reliable source of information, this thread gave insight into how a variety of different people have benefited from the use of smart watches in their weight loss journeys. It also provided a clear example of how the spread of these devices has occurred so rapidly, with many people recommending each other purchase them. In the case of the consumer, it appears that the most honest answer to the question of "why do they want this product more popular in weight?" is simple. They work. Most people do not seem to need more reason than that to purchase them and utilize them in their own weight loss.

Conclusion

Obesity is one of, if not the, greatest epidemic of the modern age. It and its comorbidities make up a larger portion of the causes of death present than ever before. The most common way people cure this disease is through weight loss. There are a number of groups heavily involved in the current rising popularity of wearable devices in healthcare, particularly surrounding their use in weight loss for this very purpose. Though the causes of this technological genre are vast and difficult to pin down, the research of this paper sheds light on some possibilities. Profit, and the chance of entering a new market, could be the primary motivators behind the corporations that produce them. Positive data correlation and patient autonomy could be the reasons behind the physicians and weight loss planners that advise them. Positive personal and peer experiences are likely the primary motivator among the consumers that buy them. While this list is not

comprehensive, it gives a clear idea of not only how different the motivations behind the new wave of smart watches is. It also demonstrates how, despite their different motivations, these three major groups can all work towards the same goal with even fervor. It is that subconscious cooperation towards topics like weight loss that will ensure the human species can overcome obstacles like obesity, given time.

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