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Turning Yourself Into Numbers

A Qualitative Study on Wearable Technology as a Calculative Practice

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Abstract: This thesis examines wearable technology (WT) as a calculative practice. Although a large body of research examines the role of WT across different disciplines, the phenomenon remains largely absent from central accounting research. WT shares fundamental characteristics with calculative practices embedded in accounting – both can compress complex processes into numerical representations. Adopting a qualitative research approach, the study is based on eleven semi-structured interviews with individuals who use WT in everyday life. The empirical material is analysed using postphenomenology which enables an analysis of how WT mediates individuals' perception and behaviour. The findings suggest that WT operates as a calculative practice, positioning it within the expanding margins of accounting. WT can compress complex human processes into a single numerical representation – a step count, a sleep score, a body battery – allowing the individual to interpret themselves through numbers. The findings further shed light on the importance of individuals' own subjectivation processes for WT to succeed as a calculative practice that steers users' conduct. In addition, this thesis identifies moments of resistance from the participants in the study, highlighting the fragile nature of WT as a calculative practice.

Keywords: Wearable Technology, Calculative Practices, The Calculating Self, Postphenomenology

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1. Introduction

“I check my watch first. God, that's creepy I have not thought of that before. [...] this morning, before I got up, I checked my watch before I checked if I felt tired or not, just to know my fate quickly. Like will this be a good or bad day?” - Participant 9

What enables this moment is a small but powerful piece of technology worn on the body. Wearable technologies (WT) are defined as “small electronic and mobile devices [...] that are incorporated into gadgets, accessories, or clothes, which can be worn on the human body” (Ometov et al., 2021, p.1). Technological advancements enable individuals to collect an extensive amount of data about themselves (Peterson Fronczek et al., 2022), and the process of doing so is developing rapidly. To illustrate this rapid development, during the writing of this thesis, Garmin issued four press releases introducing new features to their smartwatches. These features ranged from nutrition tracking to integration with the app Natural Cycles, allowing users to track fertility (Garmin, 2026).

The practice of collecting data about oneself to understand one's body and behaviours is referred to as self-tracking or the quantified self (Peterson Fronczek et al., 2022). As illustrated by Participant 9, self-tracking is no longer limited to athletes or CEOs seeking to monitor and improve performance (Sternfels and Pachod, 2025) but has extended into everyday life. Health has become an increasingly prominent priority in society, and the use of wearable technology has been identified as one of five key factors influencing this trend (McKinsey & Company, 2024). Individuals using WT to track, for example, heart rate, body temperature and sleep patterns turn their bodies into something measurable and comparable. Individuals then use these metrics as a foundation for decisions regarding health and lifestyle (Coghlan, 2023). Thus, the phenomenon of self-tracking using WT raises a set of questions that is reflected across a range of academic disciplines including sociology, health studies and human-computer interactions (Wissinger 2017; Wu, 2019; Rapp, 2023; Chandrasekaran et al., 2025).

Within sociology, research has been conducted on the implementation and usage of WT. This body of work ranges from investigating the effect WT has on relationships between human beings

(Wissinger, 2017) to potential benefits WT such as fitness trackers could have in workplaces (Richardson and Mackinnon, 2018). Within healthcare, academic research instead focuses on how WT could solve certain health issues (Wu, 2019). Wu (2019) describes how WT enables frequent and continuous measurement of physical and behavioral metrics – factors that could be beneficial in the healthcare profession. Other research focuses on barriers to individuals sharing their data with the healthcare system (Chandrasekaran et al., 2025). Yet, despite this growing body of literature, the accounting domain remains unexplored. In accounting, however, there have been calls to examine underexplored areas. Jeacle (2009) argued that accounting research should engage more directly with developments in everyday life. Jeacle (2012) additionally argued that future accounting research should investigate how accounting operates in popular culture.

It is at these underexplored spaces that Miller (1998) argued accounting is most interesting, namely what he refers to as “at its margins” (Miller, 1998, p.605). It is at the edge of the current accounting scope – its margins – that new calculative practices¹ operate and gradually become a bigger part of the accounting domain (Miller, 1998). Furthermore, Miller (1998) highlights that it is at the margin that these calculative practices interact with, challenge, and build on other academic bodies of research. However, Walker and Llewellyn (2000) highlight another perspective. Walker and Llewellyn (2000) argue that accounting as a phenomenon outside of organizations (or at its margin) is an under-researched body of academia because findings that do not concern organisations are perceived as less legitimate. Jeacle (2009) nuances this view and highlights how stereotypes regarding what is traditionally considered legitimate research shape what topics researchers investigate. There is research being conducted on calculative practices at the margin of accounting (Jeacle, 2003; Pflueger, 2016; Maier, 2017; Lassila, 2022). These findings shed light on how calculative practices operate at the margin of accounting, ranging from shaping the concept of standard sizing in the clothing industry (Jeacle, 2003) to altering games based on consumer behaviour (Lassila, 2022).

¹ This thesis adopts Miller’s (2001) definition of calculative practices: “The calculative practices of accountancy have one defining feature that sets them apart from other forms of quantification: their ability to translate diverse and complex processes into a single financial figure.” (Miller, 2001, p.381)

Accordingly, research has established how WT affects relationships (Wissinger, 2017) and workplaces (Richardson and Mackinnon, 2018) in sociology and how WT benefits healthcare (Wu, 2019) and potential barriers to this usage (Chandrasekaran et al., 2025). Furthermore, there is a large body of literature examining how calculative practices operate at the margin of accounting (Jeacle, 2003; Pflueger, 2016; Maier, 2017; Lassila, 2022). However, WT remains an underexplored area in the accounting literature. Therefore, by addressing the phenomenon of WT within the scope of accounting, this thesis seeks to contribute to previous accounting research by studying WT in everyday life and consequently extending the margin of calculative practices. Miller's (2001) definition emphasizes that calculative practices compress complex processes into a financial figure. Prior accounting research has, however, investigated calculative practices compressing non-financial figures (Jeacle and Carter, 2011). Jeacle and Carter (2011) show how TripAdvisor's traveler ratings were compressed through calculative practices and how it did not concern financial figures (Jeacle and Carter, 2011).

Using a qualitative approach, this thesis investigates the following research question: "How does WT function as a calculative practice in individuals' lives?". Through semi-structured interviews with a sample of eleven participants, this thesis explores how WT operates at the margin of accounting, by mediating the creation of the calculating self. Adopting the theoretical lens of postphenomenology, this thesis is able to shed light on what role WT has in people's lives. It provides valuable insights into how WT mediates individuals' perceptions and actions consistent with calculative practices. The theoretical framework further underscores how certain WT metrics amplify and reduce individuals' perception as well as invite and inhibit certain actions. The key findings of this thesis are threefold: First, it examines the importance of trust from the individual for the WT to function fully as a calculative practice. Secondly, this thesis highlights the crucial process of subjectivation for the individual to use the WT's output adequately. Thirdly, it highlights the limitations of WT as a calculative practice due to the broad context in which it operates, namely everyday life.

The thesis is structured by first discussing and problematising previous literature in section 2.1. Thereafter, the theoretical lens of postphenomenology will be introduced and discussed in section 2.2. Section 3 discusses the methodology in four parts: the research design (section 3.1), data

collection process (section 3.2), data analysis (section 3.3) and methodological limitations (section 3.4). Section 4 presents the empirical findings, in which three major themes were identified; quantifying the body (section 4.1), how the individual changes (section 4.2) and resisting the numbers (section 4.3). The empirical findings culminate in four discussion topics: compressing life into numbers (section 5.1), conforming to the numbers (section 5.2), the self-tracking paradox (section 5.3) and beyond the reach of numbers (section 5.4). The thesis concludes by outlining our key findings (section 6.1), discussing limitations of the study (6.2) and providing recommendations for future research (section 6.3).

2. Literature Review

The literature review include two central components of this thesis. First, it introduces the previous accounting literature to which this thesis contributes (section 2.1). Secondly, it introduces the theoretical framework through which the empirical findings are analyzed (section 2.2).

2.1 Previous Accounting Literature

This section draws on previous research in terms of examining how accounting transcends organizational boundaries (section 2.1.1), how calculative practices steer and alter the conduct of the individuals exposed to them (section 2.1.2), and prior research on accounting at the margin (section 2.1.3). The section concludes with a discussion of how this thesis contributes to prior research (section 2.1.4).

2.1.1 Accounting Beyond Organizations

There is a large body of research examining accounting as a phenomenon that extends beyond the formal boundaries of an organization (Hopwood, 1976; Burchell et al., 1980; Jeacle, 2003; Miller and Power, 2013; Cooper, 2015; Walker, 2016; Alawattage et al., 2019). Hopwood (1976) challenged the prevailing view of accounting as a static and technical phenomenon in the inaugural editorial of *Accounting, Organizations and Society*. Both Hopwood (1976) and Burchell et al. (1980) called for a research agenda that examined the role of accounting in a social context rather than only as an organisational practice.

The call from Hopwood (1976) and Burchell et al. (1980) consequently led researchers to examine how calculative practices were able to create ideals and norms to conform to (Miller and O’Leary, 1987; Miller and O’Leary, 1990; Miller, 1991). These ideal standards were translated into everyday life – shedding light on how an individual is supposed to behave (Miller, 1991). On the other hand, another body of research focused on how accounting produces numbers operating as inscriptions (Preston, 1992; Robson, 1992). Robson (1992) argues that the inscriptions were mobile and allowed “action at a distance” (Robson, 1992, p.20). Preston (1992) sheds light on how these inscriptions operate in action in the healthcare industry. Through the introduction of Diagnosis Related Group (DRG) accounting, hospitals were able to charge a predetermined amount of money based on the individual’s disease (Preston, 1992).

Eighteen years after his call for more research, Hopwood (1994) highlighted that accounting had become part of many areas of everyday life. Hopwood (1994) argued that, as accounting strengthens its foothold outside of organisations there is an even greater need for a research agenda portraying its implications. Hopwood (1994) reaches this conclusion despite developments in accounting research beyond the organization (Miller and O’Leary, 1990; Miller, 1991; Preston, 1992; Robson, 1992) since Hopwood’s (1976) and Burchell et al.’s (1980) call. Walker and Llewellyn (2000) offer a different perspective from Hopwood (1994) by delving into why there is less emphasis on research outside of organisations. Walker and Llewellyn (2000) argue that less research is conducted outside of organisations because findings concerning organisations are perceived as more legitimate.

Consistent with Burchell et al. (1980), Miller and Power (2013) argue that the “calculative infrastructure of contemporary accounting” (Miller and Power, 2013, p.5) transcends the boundaries of organisations and the formal tasks attributed to them. They argue that this is partly due to the role “it plays in shaping the world in which we live, the institutions that make up this world, the ways we understand and act on the choices open to individuals and organizations and the ways in which we administer the lives of others and ourselves” (Miller and Power, 2013, p.5). Walker (2016) builds on what Hopwood (1976; 1994) and Burchell et al. (1980) argue and gives an example of the contemporary accounting infrastructures Miller and Power (2013) introduces.

Walker (2016) portrays how accounting can be seen as a social and organizational phenomenon. The concept of social control is introduced to further illustrate accounting's broader role. Walker (2016, p.46) uses Chriss's (2007, p.1) definition of social control "to extract compliance of individuals or groups to some ideal standard of conduct" (Walker, 2016, p.46). More broadly, Walker (2016) uses Chriss's (2007, p.12) description that it encompasses "all those mechanisms and resources by which members of society attempt to assure the norm-conforming behaviour of others" (Walker, 2016, p.46). Framed in this way, social control systems confirm how "the calculative infrastructure of contemporary accounting" (Miller and Power, 2013, p.5) shapes how individuals act and behave.

2.1.2 Calculative Practices and the Calculating Self

Miller and Rose (1990) concluded that vocabularies and theories – conceptual frameworks through which individuals make sense of themselves and the world around them – should be seen as intellectual technologies allowing individuals to render their "existence thinkable and practicable" (Miller and Rose, 1990, p.27). However, they argue that these intellectual technologies are shaped and influenced by, amongst other things, inscriptions and calculations (Miller and Rose, 1990). Drawing on Foucault's concept of governmentality, Miller and Rose (1990) argue that the intellectual technologies have transitioned the steering of conduct from "social authorities" to individuals themselves (Miller and Rose, 1990, p.27).

Miller and O'Leary (1987) described how calculative practices enabled individuals to compare themselves against a certain standard. Because calculative practices translate diverse and complex processes into a numerical figure, individuals need to conform to certain behaviors to achieve an adequate score (Miller and O'Leary, 1987; Miller and O'Leary, 1990). Rose and Miller (1992) further argue that calculative practices should be seen as "technologies of government"² (Rose and Miller, 1992, p.183). It is through technologies of government that individuals can connect responsibility and calculation, ultimately creating the responsible and calculating individual (Miller, 2001; Kurunmäki and Miller, 2006). The term for the calculating and responsible individual is the

² We have adopted Miller and Rose (1990) definition of technologies of government: "Technologies of Government" seek to translate thought into the domain of reality, and to establish "in the world of persons and things" spaces and devices for acting upon those entities of which they dream and scheme" (Miller and Rose, 1990, P.8)

calculating self – an individual who actively seeks to achieve the norms and standards created through calculative practices (Miller, 2001).

Miller (2001) argues that calculative practices affect how individuals act upon the world. It is further concluded how the individual is not necessarily aware of the effect of calculative practices shaping their behavior (Miller, 2001). Mennicken and Miller (2012) nuance this view and argue that calculative practices should be seen as a technology of the individual that encourages, or requires, individuals to act on certain data.

WT allows individuals to quantify aspects of their body and health – data points that can then be used to improve one's own life (Gilmore, 2016). Consequently, when interacting with WT, the individual is responsible both for the action and the follow-up process. To be able to use the data meaningfully, the individual must go through a process Lambert and Pezet (2011) refer to as subjectivation. Lambert and Pezet (2011) find that individuals need to transform themselves into subjects that have fully internalized the values and norms of the organization, processes, or activities they are measuring. Building on the concept of subjectivation, Bay (2018) sheds light on how the calculative practices introduced by Miller and Power (2013) can change how individuals act. Bay (2018) shows how a television program, aired in Sweden, uses accounting techniques to change how individuals act and view the world. Bay (2018) concludes that accounting information and techniques – in this case financial information – need to make sense for its user. The information needs to be contextualized and customised for the user to truly be able to steer actions and conduct. Bay (2018) thus highlights how the financial information had to be internalised to be useful for its user.

Miller (2001) emphasized that one of the defining characteristics of calculative practices is their ability to reduce and simplify complex situations into a number. Cooper (2015) sheds light on how prior research has confirmed that individuals seem to accept this numerical vision of themselves. In contrast to Cooper (2015), Allain et al. (2021) argue that calculative practices, at times, faces resistance. The resistance in the work of Allain et al. (2021) stemmed from calculative practices' inability to compress human performance in the workplace into a number. Instead, the calculative practices were interpreted to be both reductive and dehumanizing (Allain et al., 2021). Because of

this resistance, new measures of performance were introduced with the aim of capturing the full scope of human performance (Allain et al., 2021). Paradoxically, Allain et al. (2021) argue that the introduction of new measures of performance only reinforces and reinvents the calculative practices.

2.1.3 Accounting Operating at its Margin

Miller (1998) argues that the innovation of accounting practices stems from research that examines these practices at the edge of the domain of accounting. It is described how central aspects in accounting today – such as discounting techniques and costing approaches – were located at the edge before they became a central part of what accounting is today (Miller, 1998). Miller (1998) concludes that accounting has borrowed, among other things, calculative practices from other academic fields to form and create what we know as accounting today. Since Miller (1998) discussed the innovative margin of accounting, there has been a large body of research examining it (Jeacle, 2003; Pflueger, 2016; Maier, 2017; Lassila, 2022).

Jeacle (2003) underscored how accounting created the standard body to which individuals compare themselves to. Consequently, this was what shaped standard sizing within the clothing industry. Although there were multiple actors involved in creating the standard sizing – ranging from retailers to governments – accounting was keeping the process together, compressing a complex process into a number (Jeacle, 2003). In contrast, Pflueger (2016) sheds light on how a survey within the healthcare industry developed into a “standardized experience survey” (Pflueger, 2016, p.28). The application of this became twofold: On the one hand, it allowed the patient to express their voice and, on the other, it became a measure of performance. (Pflueger, 2016). Consequently, this extended accounting’s margins. Maier (2017) finds that budgetary practices became interlinked with the creative practices of a television program production team. Maier (2017) concludes that the budget was not seen as an external factor that needed to be factored into the creative ideas, rather, it was intertwined. This showcased how the crew had internalised the budgetary restrictions which ultimately spurred innovative approaches to the production (Maier, 2017). Lassila (2022) finds that the calculative practices used within the gaming industry allow seemingly non-financial data, such as what day you are most active, to be translated into relevant information for financial decisions. Hence, on days when the traction is lower in the game,

designers can use calculative practices in the form of campaigns during periods of lower traction (Lassila, 2022).

2.1.4 Research Gap

Academic research acknowledges that accounting extends beyond the boundaries of organizations (Hopwood, 1994; Jeacle, 2003; Cooper, 2015; Walker, 2016; Bay, 2018; Alawattage et al., 2019; Gilbert 2021). Through calculative practices accounting can create the calculating self and steer individuals' conduct in a desired direction (Miller, 2001; Kurunmäki and Miller, 2006). Although calculative practices aim to steer behavior – they at times face resistance from individuals exposed to them (Allain et al., 2021). Hence, for the intended outcome of the calculative practices to be achieved, individuals need to internalize (subjectivate) the values and norms associated with them (Lambert and Pezet, 2011; Bay, 2018; Gilbert, 2021). Miller (1998) further emphasizes that innovations within the realm of calculative practices happen at accounting's margin. There has been a large body of research examining how these developments have taken place and what implications they have for the concepts studied (Jeacle, 2003; Pflueger, 2016; Maier, 2017; Lassila, 2022).

Consequently, this thesis aims to contribute to prior research in two main areas. First, it aims to explore how WT operates at the margin of accounting. Prior research has empirically concluded that the calculating self is created outside of organizations (Bay, 2018; Gilbert, 2021). However, prior research has not yet examined how a WT can create this person. By adopting postphenomenology as a theoretical framework, this thesis aims to understand how WT mediates individuals' perceptions and actions consistent with the description of the calculating self (Miller, 2001; Kurunmäki and Miller, 2006). Secondly, this thesis aims to contribute to prior research on how internalization of the WT's output is a vital part of this process. In doing so, the thesis extends the findings of Lambert and Pezet (2011), Bay (2018) and Allain et al. (2021) regarding how numerical representations produced by the WT need to make sense for its user. A qualitative approach using semi-structured interviews equips this thesis to investigate the research question “How does WT function as a calculative practice in individuals' lives?”

2.2 Theoretical Framework

This section introduces the theoretical lens of postphenomenology which this thesis adopts to analyse the empirical findings. The section is structured by discussing and problematising the postphenomenological lens (section 2.2.1) and ends with the implications for this thesis by adopting this theoretical framework (section 2.2.2).

2.2.1 The Postphenomenological Lens

To interpret and analyze our interview findings, we draw upon postphenomenology and specifically use concepts from the postphenomenological vocabulary and philosophy of artifacts formulated by the philosopher Peter-Paul Verbeek (2005, p.235). Postphenomenology is a philosophy of technology concerned with how technologies mediate human-world relations (Bottausci et al., 2024). It focuses on the everyday situations humans encounter and investigates how technology³ shapes them. In previous literature, the common research topic where postphenomenology has been adopted is concerning the design of technologies (Verbeek, 2005; Zheng, 2023). Within the research of self-tracking specifically, Zheng (2023) applies postphenomenology to empirically examine how the design of fitness apps mediate human-technology relations and shape the perceptions of fitness and health through the technological intentionality embedded in the design of the fitness app. With regards to WT, Rapp (2023) uses postphenomenology to identify the multiple ways in which WT mediates how we relate to the world. Within the domain of accounting, Bottausci et al. (2024) use the concept of technological mediation to explore the ethics of accounting technology, particularly the moral mediation brought by performance measurement systems. Since technology is used in different ways, it is important to acknowledge its different meanings and make clear what technology implies in this thesis. Technology can be analyzed: “as knowledge, as activity, as “will” and as object” (Carl Mitcham 1994, p.137-60 in Verbeek 2005, p.100), where we draw on Verbeek’s philosophy of artifacts which specifically focuses on concrete technological artifacts such as the WT (Verbeek 2005, p.3). Across these studies, technological mediation is the central analytical concept and will also be key in our study as it sits at the center of the postphenomenological approach (Verbeek 2005, p.11).

³ “Technology” is often used as a general term while “Technologies” refer to specific devices. In this paper, we follow Verbeek’s treatment and refer to “technology” as concrete technological objects or artifacts (p.3, p.100-101). Technologies will be used as the plural word of Technology and used interchangeably for stylistic purposes.

The relation between humans and their world happens “via” things, meaning that humans both perceive the world through artifacts and act with their help (Verbeek, 2005, p.235). This is what Verbeek refers to as mediation, where artifacts are mediators between humans and their world. They are not neutral; rather, they actively shape this relationship. Don Ihde (1990, p.141) in Verbeek referred to this actively shaping as “technological intentionality,” which means that technology has a certain trajectory (Verbeek, 2005, p.114). When a person uses an artifact, this trajectory or intention affects how they are used and thereby influences how humans see and engage with the world. The relation that emerges between humans and their world mediated by a technological artifact is referred to by Verbeek as “technologically mediated intentionality” (Verbeek, 2005, p.116). Thus, technological mediation co-shapes both humans and the world (Verbeek, 2005 p.116).

A second concept central to this study is multistability, which means that technologies cannot be separated from their contexts; rather, they only work in relation to their user. However, while being context-dependent, they can be interpreted in multiple different ways. Thus, although technology has an intentionality concerning how it is used, which influences the relation a person has with its reality once using it, a technology is always context dependent and can therefore have different purposes depending on what context it is used in. (Verbeek, 2005, p.117-118)

There are two main ways in which technologies engage with people. Firstly, they mediate perception of the world and secondly, they mediate how people can act upon it. The following paragraphs outline technology’s role in mediating perception. Building from Ihde, Verbeek (2005) presents four human-technology relations through which mediation of perception occurs. In the embodiment relation, technology becomes an extension of the body, allowing us to perceive the world through it (Verbeek, 2005, p.126). In the hermeneutic relation, technology represents the world by producing indicators and numbers requiring us to interpret it (Verbeek, 2005, p.126). In the alterity relation, the technology serves as a quasi-other and requires us to engage with it (Verbeek, 2005, p.126). Lastly, in the background relation, technology acts in the background without our awareness while still shaping our experience (Verbeek, 2005, p.127-128). Verbeek argued that technological mediation, whether embodied or hermeneutic, *transforms* experience by amplifying our perception of certain aspects of reality while reducing others (Verbeek, 2005, p.126).

While four human-technology relations exist, the WT studied in this paper sits on the wrist in the form of a watch or on the finger in the form of a ring. In these formats, the WT cannot become transparent, as the definition of embodiment requires. Thus, only the hermeneutic, alterity and background relations will be analytically useful for this study.

Just as technologies transform perception, they also translate action (Verbeek, 2005, p.161; Bottausci et al., 2024). Technology mediates the way we experience our world, and that mediated experience shapes how we decide to act (Verbeek, 2005, p.171). Latour (1994, p.33-34), in Verbeek (2005), refers to human intentions as “program of action” i.e., the intention individuals bring to their engagement with a technology (p.156). The technology, however, carries its own inscribed program of action through its design, what Latour coined the “script” of technology (Latour, 1992, p.259-60 in Verbeek, 2005, p.160). It is this script that ultimately invites certain actions while discouraging or inhibiting others (Verbeek, 2005, p.171). Importantly, as with multistability, the presence of a script does not determine how a technology will be used. Individuals may engage with technologies in different ways that diverge from what was originally intended (Verbeek, 2005, p.170).

2.2.2 Implications of Adopting the Postphenomenological Lens

By adopting a postphenomenological lens, we can examine what WT enables individuals to do that would not be possible without it. Additionally, it allows us to examine which actions are invited and which are discouraged by the scripts inscribed in the device’s design. With the lens of postphenomenology, we can look at specific everyday practices and thereby examine how WT (which gives the user calculative representations such as heart rate, steps, sleep scores and other individual performance metrics) mediates users’ perceptions and actions. This enables us to analyze the active role WT plays rather than treating it as a natural tool.

3. Research Methodology

This section describes and problematizes our chosen research methodology. It begins by outlining the research design (section 3.1), then continues by outlining the data collection process (section

3.2) and the data analysis process (section 3.3) before ending with a reflection on the limitations of the chosen methodology (section 3.4).

3.1 Research Design

The study sits within the interpretive research philosophy, which is concerned with making sense of human intentions and explaining their actions (Ryan et al., 2002, p.42). The research design is focused on individuals' lived experiences and include both participants as well as our own interpretations (Saunders et al., 2019, p.160). The aim is to understand the subjective meanings of using WT (Saunders et al., 2019, p.179).

To understand the subjective meanings of using WT, this thesis adopts a qualitative research design which is commonly associated with an interpretive philosophy (Saunders et al., 2019, p.179). Given the nature of the research question, which aims to understand *how* WT functions as a calculative practice in individuals' lives, the answers are found in the individuals' experiences. A benefit with using a qualitative study is that it allows us to analyse WT in the setting it is used - namely in individuals' everyday lives, an approach advocated by Hopwood (1983) and Chua (1986). Secondly, in order to understand how WT influences behaviour, the study focuses on the relationship between the humans and technology. As qualitative studies are designed to study participants' meanings and relationships, this further strengthened the choice to adopt a qualitative study (Saunders et al., 2019, p.180).

An exploratory cross-sectional study was chosen to examine the role of WT as a calculative practice. As the study seeks to understand how people act when wearing WT, the cross-sectional study is suitable as it is designed to focus on individual behavior (Ryan et al., 2002, p.84-85; Saunders et al., 2019, p.186-187). By asking open questions, we were able to clarify our understanding of WT as a calculative practice, particularly through asking *how* questions and a flexible and adaptable research design (Saunders et al., 2019, p.186-187). The study followed an abductive logic, moving back and forth between empirical findings and theory, allowing the research to be open to "surprising facts" (Saunders et al., 2019, p.155). These unexpected facts could thereby be explained and analysed guided by postphenomenology, but also allow for new emerging themes beyond the framework (Saunders et al., 2019, p.155).

3.2 Data Collection

3.2.1 Semi-Structured Interviews

This thesis has adopted interviews as the primary source of data. The interviews were conducted in a semi-structured format, which is suitable in settings where the aim is to understand opinions, perceptions, or emotionally sensitive issues (Kallio et al., 2016). This format enabled open questions, providing participants opportunity to give thorough answers. Doing so facilitated the possibility to better explore the research question regarding how WT functions as a calculative practice in individuals' lives (Saunders et al., 2019, p.458-459). Furthermore, it allowed us to probe responses to obtain fuller explanation and build on previous questions, which added significant depth to the data we obtained (Saunders et al., 2019, p.444-445).

As part of the process outlined by Kallio et al. (2016), a preliminary interview guide (Appendix 8.2) was created and tested in our first three interviews. This was done with the aim of improving data quality, which otherwise is a common critique to semi-structured interviews. After every pilot interview, we individually made notes regarding areas for improvement and what aspects to keep, with the aim of improving our final interview guide. The aforementioned process resulted in a final template for our semi-structured interview guide (Appendix 8.3). To address the transferability issue often associated with qualitative studies, we included both interview guides in the final paper. By making the methodological process transparent, we aim to increase the possibility of replicating the study and assessing the reliability of our findings (Saunders et al., 2019, p.213, 449).

3.2.2 Sampling Strategy

Network sampling was adopted to select interview participants. Thus, based on accessibility and relevance to the research topic, participants were selected through personal and professional networks. We sampled participants that (1) currently use a WT to allow for reflections based on near-term experience and (2) who have used their WT for at least three months. During the interview process, we initially identified recurring themes and by the eleventh interview few new aspects emerged (Saunders et al., 2019, p.315).

3.2.3 Interview Process

The interview started with an introduction to the background and aim of the study, followed by mainly open-ended questions based on postphenomenological concepts, with space for follow-up questions. All interviews were conducted digitally over Microsoft Teams, recorded with consent and transcribed with Microsoft's own tools. In line with the findings of Jenner and Myers (2019), no significant effects were observed from conducting the interviews digitally. Jenner and Myers (2019) concluded that digital interviews can be advantageous when discussing topics that are intimate, which our study arguably is. All interviews except two were conducted in Swedish; therefore, we translated the interviews into English. The transcription and translation of the interviews were conducted collaboratively by us and checked against the audio recordings after finalizing the translation of all quotes to ensure data accuracy.

3.2.4 GDPR

In line with the Stockholm School of Economics GDPR procedures, prior to the interview, all participants received a GDPR form which they voluntarily signed with their consent. The conditions were restated before each interview and the material included information regarding their confidentiality, their right to withdraw from the study, and how their data was to be handled. Participants were furthermore given the opportunity to ask questions before starting the interview and were asked after the interview how they felt.

3.3 Data Analysis

We followed the steps outlined by Braun and Clarke (2006). This included the following process: (1) "Familiarizing yourself with your data" (Braun and Clarke, 2006, p.87), (2) "generating initial codes" (Braun and Clarke, 2006, p.88), (3) "searching for themes" (Braun and Clarke, 2006, p.89), (4) "reviewing themes" (Braun and Clarke, 2006, p.91) and (5) "defining and naming themes" (Braun and Clarke, 2006, p.92). This process from Braun and Clarke (2006) resulted in the following practical implications in our data analysis. Directly after each interview, we separately did a preliminary review of thematic codes and identified interesting themes. Thereafter, a discussion together was conducted regarding what stood out in the interview. After that, each interview was transcribed manually, using Microsoft's own transcription as a base, and translated to English to ensure data accuracy. During phases (3) to (5) an initial nine themes were identified

(appendix 8.4) which were later narrowed to three major themes, with eight sub-themes in total (appendix 8.4). The process was iterative and centred on the empirical findings. The theoretical framework was used as a basis of analysis once the major themes and sub-themes had been coded. The purpose of this approach was to let our empirical findings guide how the theoretical framework was applied and not the other way around.

3.4 Methodological Limitations

The small sample size of eleven and the homogenous group in terms of age and profession are limitations to our study. Sampling a more heterogeneous pool of participants would improve the possibility of capturing more diverse factors and thereby a broader understanding of the research objective (Saunders et al., 2019, p.321). The chosen sample size was largely influenced by the limited timeframe of the study. A questionnaire would have allowed us to reach a larger sample size, but this would have come at the expense of the depth enabled by interviews (Saunders et al., 2019, p.445). A second limitation to our study concerns the lack of standardisation in semi-structured interviews which can lead to potential interviewer bias (Saunders et al., 2019, p. 447). The flexibility in the chosen interview format was deemed necessary due to the explorative nature of the study. To mitigate interviewer bias, as previously outlined in the data analysis paragraph, initial independent reflections were conducted before being consolidated.

4. Empirical Findings and Analysis

This section presents the empirical findings from the interviews to answer the question: *How does WT function as a calculative practice in individuals' lives?* The findings are first organized into empirical categories, after which theoretical concepts from postphenomenology are integrated to provide a preliminary analysis. The three themes derived from the method described above are: how individuals quantify their body (section 4.1), how the individual changes (section 4.2) and how they resist the numbers (section 4.3).

4.1 Quantifying the Body

The first empirical category reveals how individuals in this study predominantly measured their workout progressions (4.1.1), sleep patterns (4.1.2), stress levels (4.1.3) and the holistic picture of wellbeing (4.1.4).

4.1.1 Workout Progression

One clear usage of WT is that it enables the user to measure and score their workouts. Participant 7 describes how they use the WT to ensure that workouts have the right level of intensity, particularly regarding heart rate. Participant 7 further explains how the WT is what enables them to see whether the development of the activity is positive or negative. This can be done by seeing whether metrics such as maximum oxygen capacity (VO2 Max) increases or decreases over time:

“What affects me the most is pulse and when I workout I want to find the right pulse zone for the right kind of workout. I think it is important that it measures correctly.” (Participant 7)

“I look at my pulse and VO2 max to track my workout. Am I getting better, am I developing positively or negatively? These parts are what you commonly look at when you track specifically running.” (Participant 7)

In contrast to Participant 7, who relies on the numerical output to measure whether the progression was positive or negative, Participant 6 instead places a larger emphasis on the relation between them and the WT. When Participant 6 conducts a workout, there is a clear relation between the numbers the WT produces and how that specific workout is interpreted. By combining the data from the WT with Participant 6’s own interpretation of how those numbers should be reflected in a bodily reaction, they are able to construct workouts that develop over time:

“When I’ve been running, I’ve been actively glancing at it just to see, follow and understand. What I am trying to do during workouts when I am watching is to see what the pulse actually is according to the watch, while at the same time reflecting around how I feel. Is it challenging now in relation to how it felt last time or a month ago? That is something I have

started to do. I do it in different ways - partly in the way I just described and partly to understand the different levels. When I feel that I am leaving a particular running zone - where I should be able to cruise - I reflect that I should be in a certain pulse range. I then glance at my watch and see that I am actually at that level. The other part is the historical comparison, the fact that it is not as challenging to be at the same level as it was in the past. That I have adapted to the tougher training.” (Participant 6)

Both Participant 7 and Participant 6 used their WT to quantify aspects of their workout. The difference in usage lies in how these quantified measures are interpreted. Participant 7 highlights that the number from the WT is the truth and hence depends on the accuracy of the WT to see a positive or negative progression. Participant 6 combines the numerical output from the WT with their own body’s reaction to different stages of the workout, shedding light on a more iterative relation where neither their own reaction nor the WT’s data cover the full truth. Participant 7 has what Verbeek (2005) refers to a hermeneutic relation with the WT – having internalised that the numbers generated by the WT are the representation of Participant 7. On the other hand, Participant 6 has what Verbeek (2005) refers to as an alterity relation. The numbers generated from the WT have not been internalised and are rather, information Participant 6 relates themselves to. Hence it can be seen as an external source either confirming or rejecting their own experience and feelings. What distinguishes these two participants is the trust they place in the calculative abilities of the WT. Participant 7 believes that the WT translates the complex process of workouts into an accurate measure whereas Participant 6 needs to confirm this value with one's own body’s feeling. Hence, these findings highlight different levels of trust.

4.1.2 Sleep Understanding

Before the introduction of WT, sleep was an aspect of life that individuals could not easily measure or score. Instead, the individual had to rely on their own feelings regarding how well they thought they had slept. Participant 8 describes how, first thing every morning, they check how they slept:

“Sleep is among the first things I look at in the morning. Like OK this is how I have slept last night.” (Participant 8)

Participant 4 bought their WT before starting work at their current job. Participant 4 knew that the working hours would be long and that the culture would be performance-driven and therefore, Participant 4 mainly used the WT to track sleep and stress throughout the day. Participant 4 thus highlights an intentional usage of the WT by clearly delegating the task of keeping track of sleep and stress to the WT:

“What I mainly use it for is sleep, and also stress. There is this thing called restorative time which is like two counterparts you can see during the day, how much I have stressed and how much I have been in restorative time. Those two things are what I look at the most. Then also activity, and not in the way of like checking my pace when I run, rather in the way of making sure I have been active today.” (Participant 4)

Participants 8 and 4 are seen to have what Verbeek (2005) refers to as a hermeneutic relation to their WT when it comes to tracking their sleep. Through using WT, individuals are enabled to translate the complexity of a night's sleep into a single measure. Instead of having to interpret how they feel after sleeping, the WT can compress this complex process into one single measure that Participants 4 and 8 adopt at face value.

4.1.3 Stress Management

WT also enables individuals to measure their stress level. The WT enable the user to quantify stress, and it transforms the feeling of stress into numbers that can be compared and used to verify the user's own feeling. Participant 8 describes this process and highlights how they think it is interesting to compare their own bodily reaction of stress with what the WT interprets:

“It has also been a good tool to measure stress, since I actually do a couple of different things during my days, so sometimes when I feel stressed, it can be interesting to see that I physically am or that the ring realize that I am stressed.” (Participant 8)

Although the output generated is useful to verify the felt stress-level, participants argue that the stress level generated by the WT is often higher than what their own feelings suggest. Thus,

frictions arises between the WT and the user regarding what is true. This process is discussed by Participant 9:

“Another thing I frequently measure is my stress level. And often it (the watch) tells me that I am more stressed than what I feel I am. The scale goes from blue to dark orange and often I am in the light orange interval. I don't really get it, and I think it is deviating. It exaggerates a bit too much. It makes me worried since it is bad and a sign of being unhealthy. Sometimes when it is ridiculously off I just get annoyed. I don't know how it calculates this.” (Participant 9)

The factors behind the WT's current stress indicators are difficult to identify. With the current functions, a default notification is given to the user regarding the stress level with little to no explanation regarding how it was computed. Thus, for the metric to truly be useful, Participant 9 argues that an explanation of the derivation is needed:

“In the same way that I get my morning notification regarding my sleep and what it depends on. I want at the end of my day a similar notification regarding my stress levels and what that depends on. Like that my pulse has been this high during these minutes, or like some kind of indication. I think that only the fact that stress is only a scale with numbers without being able to derive where it comes from is a bit weird” (Participant 9)

What Participant 9 displays with this last quote is how, in an ideal scenario, the relation with the WT should be a hermeneutic one allowing Participant 9 to interpret their feelings through a score. In its current form, the relation can be seen to be an alterity relation. The stress scores generated by the WT are compared with Participant 9's own bodily reaction, where the latter usually triumphs. This relation stems from the WT acting as a black-box – only showing the output in the form of colours and not necessarily providing any justifications for it. In this instance, the WT fails to capture the complexity of the factors driving stress into a single value. Consequently, when WT generated data contradicts lived experience, it can induce unpleasant feelings in users. These feelings might not have been as prevalent in their lives if the black-box nature of the WT did not exist.

4.1.4 Holistic Picture of Wellbeing

The WT additionally provides the user with general scores of their day, how prepared they are for the upcoming day and at times quarterly reports of their indicated well-being and performance. This function of WT works as an overarching measure that shows the general wellbeing of the user. Throughout the day the user can then do different activities to either increase or decrease the score. Some WTs additionally provide the user with a quarterly report, which allows them to track performance over time easily. Both scenarios are discussed by Participant 8:

“I think it gives a daily score of physical activity in the past days and how you have slept the past days. So when I wake up in the morning and open my app I can see how I have slept and what my daily score looks like for that particular day. Then you can do things to either improve the score or worsen it throughout the day. If I am very stressed during the day the score will go down, if I instead went out for a nice walk and took it slow the score would improve. You also get the quarterly statement and then the ring has done everything for me so I can just go in and scroll through it and look at my patterns during an entire quarter.” (Participant 8)

“I actually received my quarterly statement today [...] it is a specific pattern where I see how physical activity is connected to my sleep quality. That is my biggest conclusion.” (Participant 8)

Similarly to Participant 8, Participant 4 receives a daily readiness score and showcases a clear understanding of how the general score is computed. Participant 4 is additionally able to find a correlation between the readiness score and how the WT gives their corresponding daily movement targets:

“I get a readiness score at the beginning of the day. It is based on how I slept, what resting heart rate I had, the amount of activity I did the prior day, and it is a score between 1-100. Based on what readiness score you have, you receive a daily activity-goal. If I drink

alcohol and sleep few hours [...] I get a lower daily activity-goal. Whereas if I had a long night sleep and moved my body at a good level, then I get a higher goal. And you should preferably reach the activity goal.” (Participant 4)

While both Participant 8 and Participant 4 could derive how they could improve, Participant 5 was more uncertain about how their “body battery” was calculated. Participant 5 thought it was hard to understand what the body battery was based upon, but despite the ambiguity, they identified workout, sleep, and stress as factors affecting body battery. Participant 5 did not view it as the “full picture” but valued the direction on which they could rely:

“If I have a body battery which is over a particular amount the watch tells me that I have rested and been working out well. It is telling me that I ran out of my battery and then recharged it, which is positive. But it is not like it shows me a green check mark or red cross. I must go in and read in that case. It is barely an overall assessment, rather it is only how I filled up and ran out of battery. It does not show steps and all of that taken together.” (Participant 5)

“If I eat dinner and the watch thinks that I have a high stress level it runs out faster, the same happens if I work out. If my sleep is poor, the battery does not recharge fully. So, it is aimed as an overall assessment. I trust the direction it takes [...] but I don't care about the absolute levels.” (Participant 5)

The usage of these above-mentioned scores generated by the WT depends on the interviewees’ understanding of them. For Participant 8 and Participant 4 there is a clear derivation regarding how the score is computed. This drives trust in the data points. This suggests a hermeneutic relation exists and the WT mediates the complex process of an entire day into a single holistic number that participants 8 and 4 can internalize. In contrast, Participant 5, who does not fully grasp how the score is computed – or, to some extent, does not put in the effort to understand it – has an alterity relation with the WT. This phenomenon also appeared in previous findings (see 4.1.1) where the participants who had an alterity relation did not purely rely on the metrics they could not understand. Surprisingly, Participant 5, who also had an alterity relation, acknowledged

that, although the derivation of the data point was opaque, they still trusted the direction. This brings to light how Verbeek's (2005) different relations of mediation can exist to varying degrees.

4.2 How the Individual Changes

Section 4.1 revealed what aspects of their lives participants measured. Section 4.2 dives into how the participants' perception (section 4.2.1) and behavior (section 4.2.2) have changed from the mediating effect of WT.

4.2.1 Perception

As underscored in section 4.1, WT allows individuals to quantify aspects of their bodies and lives that they were not previously able to. This section highlights how WT additionally affects individuals' perceptions. Participant 9 describes an example of this process where the sleep score, which is checked each morning, defines whether they feel alert or tired:

“I check my watch first. God, that's creepy I have not thought of that before. [...] this morning before I got up I checked my watch before I checked if I felt tired or not, just to know my fate quickly. Like will this be a good or bad day? And when it told me that I had recovered well I jumped out of bed and could be happy.” (Participant 9)

Participant 9 sheds light on how the WT impacts how they perceive themselves before reflecting on how they feel. This is a classic example of how a hermeneutic relation with technology functions. Instead of feeling how alert Participant 9 is on their own – they experience and perceive themselves through the numbers generated by the WT. Hence, the WT plays an important role in what aspects are being amplified. Similarly to Participant 9, Participant 7 showcases how the WT amplifies certain aspects and thereby transforms perception:

“If I wake up and feel that I have slept bad but the watch is telling me that I have had a good night sleep, my mood shifts towards thinking that I have slept well. While prior to

interacting with my data I felt that it was quite a bad night with a lot of dreaming and moments of waking up. I get the opposite feeling there.” (Participant 7)

“When the watch tells me I have a low body battery, I feel tired even though I might not be.” (Participant 7)

While Participant 9 immediately interacts with their WT, Participant 7 begins by reflecting on their initial feeling first, however, after interacting with the WT, Participant 7’s perception transforms toward the direction of the WT. Participant 4 highlights how in situations when their own feeling correlate with the WT’s numbers, the technological mediation amplifies the feelings:

“If I sleep bad I don’t feel great and with the Oura ring I feel even worse because then I can see things like "yeah this was not good" and "this you have to do something about" and then I feel even worse. But on the other hand, when I have slept well and the ring tells me "you are so good now that you have slept well" I feel even better.” (Participant 4)

On the contrary, when the quantified body does not match the participant’s own bodily feeling, the WT can generate unnecessary stress. Participant 7 describes how they get unnecessarily stressed. Participant 7 acknowledges how the WT pressures them to be at a certain standard, but when the quantified body does not meet that standard, it generates stress:

“Let’s say that it has been a long day, I have worked out and moved a lot, then I go to bed with quite low body battery. Then the body needs to recover, and I am used to seeing the body battery recharge to 100 when I wake up in the morning. But then when I wake up and it is below 100 [...] then I think that I have slept my hours and I feel well rested but my body battery is not 100, so perhaps I am not as recovered as I should be. While normally I should think that when I have slept my hours I am well-rested. In those moments it becomes an unnecessary stress reaction, feeling “oh no why am I not better recovered than how I am feeling?” (Participant 7)

As this section has empirically shown, WT mediates how the participants perceive themselves. What becomes evident is how the data points from the WT override the participants' own perceptions. The reason could lie in all participants having a hermeneutic relation to their WT. While the postphenomenological vocabulary identifying what is amplified, what is arguably even more interesting is what is reduced due to the presence of a WT, which the vocabulary also can analyze. In Participant 7's case, the WT reduces contextual factors such as having had a long day and being active. The score generated by the WT is what matters, ultimately transforming Participant 7's perception. These shifts in perception thereafter alter individuals' behaviors as the empirical findings in section 4.2.2 will reveal.

4.2.2 Behaviour

Consistent throughout the interviews, a change in behaviour due to wearing a WT emerged as a dominant theme. Particularly, the activity of running changed. Rather than running at an intuitive pace, they could monitor their speed continuously through the device. This is represented in both Participant 10's and Participant 5's experiences:

“I think it's very nice, especially to track your heart rate. You know that you're not going too fast or not going too slow, depending on what you want to achieve.” (Participant 10)

“It encourages me to run the hard workouts enough hard so that I do not worsen my capacity. It is a sort of confirmation that I actually am at the intensity I want to be at. Which I experience as something positive. For example, take a specific interval-workout, it is very easy to go out too hard in the beginning and then you are not able to run the remaining intervals, but then you can use it [the watch] as an encouragement to hold back in the beginning. A tool in a sense.” (Participant 5)

The findings from Participant 5 and Participant 10 illustrate Verbeek's (2005) concept of translation of action. It invites the action of monitoring their running experience in terms of their speed while simultaneously inhibiting the intuitive and felt approach of running. The WT functions as a mediator that not only records what the body does but actively transforms what the body can do. For example, when Participant 5 is using the WT they can endure an entire workout, something

they did not always manage to do prior to using a WT. While the preceding examples are drawn from the context of running, similar translations appear in the domain of sleep. Participant 7, for example, consults their WT upon waking up to decide if it is time to start the day or go back to sleep:

“If it is during a weekend, I try to sleep an extra hour if I look, and I mean that is probably some kind of problem that the first thing I do when I wake up is to look at the watch wanting to see what it says.” (Participant 7)

The WT in this situation, like the other examples, translates what was previously an intuitive decision based on feeling into a calculative act that needed to be interpreted. The WT invites the action of returning to sleep when the data show low recovery. It also inhibits Participant 7 from grounding the decision primarily in felt sensation. All three participants - 10, 5 and 7 - showcase a hermeneutic relation to their WT. Beyond mediating chosen activities that are connected to a goal, such as improving one's running abilities or maximizing recovery, WT intervenes in other moments of daily life. In these situations, the user receives a notification that suggest them to directly change their behavior. Participant 8 describes how, when they receive a notification from the WT, they stand up more frequently when working, something which they had not previously done:

“Sometimes when the ring says it's time to stretch my legs, I raise my desk and stand up to work for like ten minutes. I've never done that before.” (Participant 8)

Participant 8's relationship with their WT is an alterity one. It operates as a quasi-other giving suggestion of how to act, which the participants need to relate themselves to. The translation of action is the shift from sitting to standing, where the WT invites the action of movement while discouraging the activity of prolonged sitting. Similarly to Participant 8, Participant 9 also has an alterity relation with the WT. In contrast, Participant 9 offers a slightly more negative perspective to how it influences behavior:

“It is not a positive feeling that it tells me to get up and move. I still stand up, walk ten steps so the watch is satisfied with me. It feels unrealistic and I get annoyed by talking about this. So triggered.” (Participant 9)

The examples from both Participant 8 and 9 capture how the unconscious activity of sitting down suddenly becomes, due to the WT, an important aspect to manage. Participant 9’s negative approach towards it adds an additional layer of theoretical depth. While the interviewees who cared about running in the beginning of this section saw the WT as an encouraging tool to reach their goals, Participant 9 showcased a sense of obligation towards, and pressure from, the WT.

While the preceding examples illustrate how WT translates action in concrete moments, the general reflection from the participants reveals that over time a deeper restructuring of behaviour arises. The WT forms new ways of living. This is illustrated by Participant 8, who changed their sleep schedule to improve their sleep and recovery. Participant 8 shares how, after starting to wear a WT, they identified when to be awake and when to sleep:

“Unfortunately I am a person who is tired both in the evening and in the morning. So I have always thought I have to go to bed early like 9 pm and sleep twelve hours to function. But I have learnt I don't need that, apparently, I am a person who should be awake late at night and then sleep in the morning. And I do not have to sleep that many hours. I feel that I have a much more positive approach to staying up late at night now when I know that I don't need to go to bed and I also finally have a good excuse to sleep in the morning.” (Participant 8)

The translation of action in this situation is the fundamentally different sleep schedule. The WT invites Participant 8 toward a new sleep pattern and inhibits the old way of sleeping. Over time, the relationship with the WT has turned into a background relation. The WT is not actively directing Participant 8 in how to sleep because the calculative logic has been internalised and manifests as sleeping routines. This is prevalent in the empirical material across different use contexts. For example, Participant 7 acknowledged established workout routines and Participant 6 created a schedule for their running sessions:

“In my opinion I have worked out way more and established routines around this whole thing [workout]. In this way I see it as something very positive.” (Participant 7)

“Apart from glancing at these statistics that I mentioned, it also affects my workout schedule or rather creates it. I have made the schedule more gamified, and because I track, it becomes more fun. It helps me to run at all - just running around aimlessly would be awful.” (Participant 6)

Beyond internalising the calculative logic that WT invites through numerical representations, a secondary layer emerges in Participant 6’s statement. If Participant 6 did not wear a WT, Participant 6 would perhaps not run at all, or at the least, it would be a worse experience. The device has become so deeply integrated with Participant 6’s running behaviour that, without it, running would not feel the same. This showcases a reversed transformation of perception. Without the WT, running is now less enjoyable for Participant 6. A similar outcome is represented by Participant 7, who shared a situation where they in fact lost motivation due to not wearing their WT:

“There was a time when the watch was broken, then I directly felt that I did not have a need to work out and I thought it became quite boring to work out without it which made me quite unmotivated to maintain my activity level.” (Participant 7)

The empirical findings show how individuals changed their behaviour when using WT. This aligns with Verbeek’s (2005) concept of translation of action. With the guidance of different relations of mediation, deeper insights emerged. Participants having a hermeneutic relation with their WT initiated their own goals such as increasing physical capacity and maximizing recovery. Consequently, they used WT as a tool, receiving numerical measures as a sign of progress or achievement. Ultimately, this shaped their actions to maximize these numbers. In contrast, participants having an alterity relation with their WT were prompted to act in a certain way. The notifications issued by the WT had twofold interpretations, the participants either felt encouraged or pressured to act upon the suggestion. Although the notification implied different interpretations, it resulted in conforming action. Lastly, as time passed - the calculative practices enabled by the

WT transformed the relation into a background relation. Through internalising the calculative logic of the WT, the practice became embedded within the participants' identities. Without the WT they lacked both the motivation to work out and a clear direction to act towards.

4.3 Resisting the Numbers

Sections 4.1 and 4.2 have shed light on what individuals measure and how it alters perception and behaviour. The third and final theme reveals how individuals at times disengaged from certain functions (section 4.3.1) and even decided to remove the WT completely (section 4.3.2).

4.3.1 Turning Off Features

Some participants turned off functions included in the WT that they did not use. Participant 11 highlights how one of the functions embedded in the WT made them feel worse before running a marathon. Consequently, Participant 11 decided to remove that specific function after the marathon:

“When I ran a marathon, I felt quite weak. Then my watch showed my fitness score, [...] I received my lowest score ever and immediately thought that this was not going to be a good race. It affected me mentally to a great extent and shaped my perception of the remaining 40 kilometers I still had left to run. I have actually turned that function off now. I realized that it does not take context into account, for example at the beginning of the marathon I had consumed two energy drinks and had a lot of adrenaline. This caused my heart rate to be higher, which resulted in a lower fitness score. It was an example of how this metric was not correctly tuned. Therefore, it felt better to remove the function entirely.” (Participant 11)

Participant 9 introduces another reason, whether the user perceives a measurement as useful determines whether they use it. Participant 9 describes that the WT has a function that reminds them to drink water and asks them to make notes when they do. Participant 9 considers this function completely useless and consequently turned it off:

“I had a reminder to go and drink water and note how often I drink water. I have turned off that function, a completely useless function. Who tracks how often they drink water? It is a strange function to daily fill in how much water you drink and be reminded of it. I do not see what I would gain from knowing how much water I drank in a day?” (Participant 9)

If the background relation in section 4.2.2 underscored how metrics generated by the WT had been internalized by the participants – this section sheds light on the opposite. The calculative practice of the WT extends into territories that participants consider outside its legitimate scope. Although the WT can transform complex and diverse experiences into a concrete number, the WT at times extends beyond the participants’ own intentions. Thus, when the program of action of the individual differs from the script of the WT, the calculative practice is removed. Section 4.2.1 showed how the WT managed to amplify the numerical representations and reduce the awareness of its context. However, the findings in this section problematize that view. Here, the contextual factors triumph over the output from the WT, consequently making the participants turn off features.

4.3.2 Removing the WT

Not only did participants turn off features they did not like. At times, some even decided to remove the WT entirely. Participant 4 underscores how the WT possesses the power to alter moods in an instant by displaying bad scores. Hence, at times when faced with the decision of either keeping the WT on and receiving a bad score or removing the WT entirely, the latter is preferred:

“So in situations when I know that my sleep will be bad, for example when I took a night train and slept in a room with four other people, I don't want to start my trip with "what the hell happened last night?" and then I allow myself to take the ring off. It is a way to spare me from feeling anxiety, or not anxiety that is too drastic, but a poor mood.”

(Participant 4)

Participant 9 continues, describing how they do not want to see the data points during tough periods, due to all metrics being at their worst level:

“Mainly it is because I do not want to see the data. When I wore my apple watch I was able to see weekly statistics and if it was a period when I was not very active, you could clearly see that I was at the bottom in everything.” (Participant 9)

It is not only an aversion to bad scores that causes participants to remove their WT. Participants also describe feeling the WT’s presence when wearing it. The participants feel that they are constantly being monitored and measured and consequently want to free themselves from this grip. This is a process described by Participant 9:

“[I take it off...] when I feel that I just want to chill for a moment. Sometimes it can be demanding to see that the statistics look really bad, then I can take some breaks.”
(Participant 9)

The participants describe how they take off their WT either when they do not want bad values or they do not want to feel the pressure of the WT. This can imply that over time WT has, through its calculative practices, created standards. The program of action of the participants is to meet these standards. Hence, what was seen as an advantage of WT in section 4.1.1 appears to have a different meaning in this situation. While participants previously advocated for the benefit of tracking progress, Participant 9 reveals another side of the coin. In moments when the participants are not on track, they decide to remove the WT, sparing themselves the unpleasant feelings of not meeting these standards.

5. Discussion

Our empirical findings reveal how individuals using WT are given numerical representation of complex actions and act on those representations. The following section is structured by first discussing how individuals’ lives are compressed into numbers (section 5.1), followed by how individuals conform to the numbers (section 5.2), then signifies the self-tracking paradox (section 5.3), and concludes with a discussion of what is beyond the reach of numbers (section 5.4).

5.1 Compressing Life to Numbers

The findings in section 4.1 revealed how the WT enabled the participants to turn their workouts, sleep, stress and entire days into data points. This is similar to how Pflueger (2016) underscored how patient surveys were able to transform patient experiences into numerical representations. The calculative nature of WT is consistent with Miller's (2001) definition of calculative practices. By amplifying the numerical representation of an activity, WT allows the individual to interpret these data points as a representation of themselves. Hence, the entirety of complex and diverse actions is compressed into a single numerical representation which ultimately requires interpretation by the user. The motivation for using WT differed amongst the participants. While some used it to track progress of physical state, others used it to maintain a certain standard of stress and sleep. This stands in contrast to Jeacle's (2003) study, where the goal was clearly defined, i.e., to create the construction of a technology of the body in the clothing industry. These variations in usage highlight the participants' different programs of action. Although different participants had the same WT, they used the calculative practices in different ways. This sheds light on Verbeek's (2005) term multistability, the seemingly same WT is used differently among participants.

The different use of WT can be further nuanced by turning the discussion towards the different human-technology relations. Depending on the human-technology relation, the participants conveyed different levels of trust in the calculative abilities of their device. Those who had a hermeneutic relation with their WT saw the numerical figure as a direct representation of their own experience. While those who had an alterity relation, contrasted their own feelings with the numerical representation generated by the WT. There are also different degrees of alterity relations. For Participant 6 when using WT during workouts, the WT functioned as a quasi-other confirming their own feeling of the progression. On the contrary, Participant 9 underscored that due to the black-box nature of the WT when measuring stress levels, they could not trust the numerical representation. The above reasoning suggests that the factor of trust plays an important role for the WT to fully serve as a calculative practice for the individual and help to explain why participants acted differently. In turn, the underlying driver for trust seemed to come from understanding how the numbers have been derived. However, as the WT has a black-box nature, establishing that understanding is difficult. The participants who had a hermeneutic relation with their WT seemed to have a higher level of trust – they did not question the truthfulness of the numerical

representations but rather interpreted them. In the hermeneutic relation this numerical representation has become internalised, not requiring any questioning. This implies that these participants have subjectivated the values from the WT and fully conformed to it, confirming the findings of Lambert and Pezet (2011).

5.2 Conforming to the Numbers

Although trust was found to be an important aspect for participants to alter perception, WT has additional ways of influencing behaviour. The empirical findings emphasize how WT using notifications mediates what actions participants are supposed to take. Participants complied with the WT's notifications, however, the experience of doing so varied. Some felt encouraged and some felt pressured. This suggests that these actions were not always embedded within participants' intended usage. This underscores how trust does not capture the full essence of whether the WT is successful in steering the behaviour of the individual. WT can also steer behaviour through encouragement and pressure, shedding light on how the individual does not necessarily have to have fully internalized the process beforehand. The notifications are seen to have a similar function to the campaigns in game settings. Lassila (2022) highlighted how game producers with big data were able to steer individuals to play the games at times when the traction was lower. While the case of Lassila (2022) showed how individuals could decline the suggestion to play, our findings show that participants conformed, either because they felt encouraged or because they felt pressured to.

In addition, the WT creates routines that change behavior. The findings of this thesis show how the calculative practice of WT can also become a significant part of participants' everyday lives. This was illustrated by Participant 6's workout schedule as well as Participant 8's sleep schedule. Through continuous measurement over time, WT changes priorities and habits, shaping the identity of the participants. This is consistent with the findings of Maier (2017), regarding how calculative practices created the identity of the television program crew, as they became embedded in their work.

Furthermore, the transformation of self-knowledge through numerical representation does not produce uniform behavioural outcomes. The calculating self, relying on numerical representation

created by the WT, does not conform to the calculative practices in the same manner. For example, Participant 8 changes their sleep schedule to achieve a better sleep score whereas Participant 7 decides to sleep extra hours when the data from WT is not satisfactory. In essence, Participant 8 pre-emptively alters behaviour and Participant 7 reactively changes behaviour to meet desired scores. These findings highlight how the *same* score, in this case sleep, shapes behaviour in different ways. It also underscores how individuals internalise the numerical representations in alternative ways – Participant 8 changed their schedule whereas Participant 7 slept longer – whilst both aimed at achieving a higher sleep score.

The discussion in this section underscores how the participants show different degrees and variations in their subjectivation. Lambert and Pezet (2011) highlighted how for individuals to truly be able to govern themselves, they need to have internalised the values and norms associated with the practices that they are measuring. The above discussion both aligns with this reasoning and reveals additional nuances to why people change their behaviour.

5.3 The Self-Tracking Paradox

The empirical findings in section 4.2 underscore what Verbeek (2005) articulated, the inherent power of the WT to transform perception and translate action. This study found how the WT transformed the participants' perceptions of their own felt experiences to interpretations of numbers. This was similar in Lassila's (2022) finding, in which the design of games influenced gamers' actions, ultimately leading them to play more than initially intended. Since technologies are not neutral, the WT does not just report numbers but has the power to define what a "good" score is. This poses the question: Who should be listened to - the initial feeling or the numerical representation?

WT enables an understanding of a contexts that would otherwise be difficult to attain, such as heart rate and sleep patterns. Thus, the WT enables the individual to deepen their own self-knowledge. This could explain why the empirical findings also revealed that some participants reported that they relied on the direction but not on the absolute numbers. Ultimately, the calculative practices performed by the WT mediate individuals into following the WT's numerical representations, by doing so, the participants become calculating selves (Miller, 2001; Kurunmäki and Miller, 2006).

The amplification structure of WT steered some individuals' perceptions in ways that made them conform to the numerical representation without even reflecting upon it. For other participants, the WT instead transformed their perception in another direction where it reduced the contextual factors which they previously considered. Paradoxically, self-tracking is adopted to understand oneself better. However, when the hermeneutic relation exists, the WT is interpreted to know the participants better than they know themselves. Taken together, the findings suggest that WT restructures the relation between participants and their own self-knowledge. What earlier was directed by a complex process including all sorts of factors has been reduced to a single numerical representation that they *trust*. Coming back to the question of who should be listened to, the findings suggests that participants tend to listen to the WT rather than their initial feeling.

5.4 Beyond the Reach of Numbers

This thesis adopts the perspective of the individual and their everyday life. Although the WT can compress complex actions and situations into a numerical representation, it is unable to do so for *all* aspects of everyday experience. This is due to the complexity of everyday life. The WT has little flexibility in its numerical representation when it comes to factoring in other actions taken by participants in their lives. For example, sleeping one less hour to be able to meet one's grandparents. In contrast, Maier's (2017) findings, shows that the calculative practices only are applicable in the scope of the production team in television programmes. In Maier's (2017) study there are clear boundaries within which the calculative practices, embedded in the creative practices of the production team, operate in. Similarly, Lassila's (2022) findings about how big data is used to steer the actions of individuals playing games are mainly applicable in the context of the games. In contrast, there are no limits to what everyday human life might entail. Thus, although the calculating self is created through the mediation of the WT, it only changes individuals' actions and behaviours in the specific parts of life that it is measuring. Ultimately, the WT does not mediate all social processes in life – there is a limit to what actions the WT is able to grasp and measure. The discussion in this section should not be seen as a contradictory argument that calculative practices do not extend beyond its intended use, rather, that the context in which WT operates has no clear boundaries.

Due to the loose boundaries of what everyday life entails, WT needs to navigate what parts to compress into numbers. Consequently, at times, it extends into territories that the participants do not want it to govern. Now instead shifting the perspective to the user, the reason the participants do not want it to govern certain aspects was explained in two ways. First, the WT failed to account for the right context, as illustrated in the marathon example. Second, what was being measured felt useless, as exemplified by the case of tracking water consumption throughout the day. The second explanation aligns with the findings by Bay (2018) that, for users to act on accounting information it needs to make sense for the user. In our findings, considering a functionality useless imply that the participants fail to make sense of its use, thus resulting in turning off the feature.

The more drastic decision, namely, to remove the WT entirely, revealed two additional perspectives when the individual did not want to be tracked by the WT. They removed the WT to avoid bad data and reduce pressure imposed by the process of being measured. In contrast to previous discussion regarding the limit of the reach of WT, this view sheds light on the perspective of the participants – there is a boundary beyond which they do not want to use the WT. Hence, the removal of the WT signifies that the individual has not internalized the concept of being measured *all* the time. WT shapes how participants are supposed to act, but does not determine their actions. The result of a failed subjectivation process consequently heightens the dissonance between these two aspects. At the end of the day, the individual's decision triumphs over the WT's data. When the participants fail to make sense of the use of certain metrics it results in resistance. While Allain et al. (2021) explained the reason for resistance when calculative practices failed to capture the complexity of human performance at work, our findings identify the reason for resistance to be WT's inability to capture the everyday in which the individual does not want it to measure. The feeling of uselessness, avoidance and pressure signal a failed subjectivation process. In contrast to Allain et al. (2021) who argued that resistance led to introducing new measures that then reinforced the calculative practices, our findings highlight how calculative practices are removed.

6. Conclusion

The conclusion of this thesis begins by reiterating and summarizing the key findings and their implications from the discussion (section 6.1) and then continuing by outlining limitations to the study (section 6.2). It concludes with outlining recommendations for future research on WT within the domain of accounting (section 6.3).

6.1 Key Findings

This thesis set out to study WT in everyday life. In particular, to explore how WT function as a calculative practice. Hence, the aim was to introduce WT within the domain of accounting and consequently expand accounting's margin as articulated by Miller (1998). The empirical findings highlight how the WT can compress complex actions and experiences into a single numerical figure, consistent with Miller's (2001) definition of calculative practices. They also reveal how the participants interpret themselves through the numerical representation generated by the WT. Furthermore, the findings underscore behavioural changes among participants using WT. Thus, the person Miller (2001) and Kurunmäki and Miller (2006) referred to as the calculating self is created through the mediation of WT. For participants to act on WT's numerical representations, they need to trust the WT's output. This level of trust varied across participants and originated from what type of human-technological relation the participants had with WT. The different human-technological relations led to different uses of WT. Thus, the first key finding of this thesis regards the importance of trust for WT to be fully embedded into individuals' lives as a calculative practice. Consequently, different levels of trust made the participants conform to the WT's numerical representation differently.

Secondly, this thesis contributes to previous literature on subjectivation. When the participants had a background or hermeneutic relationship with their WT, it restructured their own self-knowledge. Consequently, they acted on the WT's output rather than listened to their own feelings. In contrast to Lambert & Pezet (2011) and Bay (2018) who articulated how individuals need to internalise accounting information for it to be useful, the findings of this thesis suggest that the WT shapes the identity of the individual. Individuals trust the WT more than they trust their own feelings and hence, individuals can be seen to not only internalise the values of the WT, but also shape and reconfiguring their identity.

Lastly, WT's ability to operate as a calculative practice was found to be limited by existing in a broad context, namely everyday life. Unlike previous literature on calculative practices at the margin, WT operates with loose boundaries. At times, this leads the WT to measure aspects participants consider useless, or fail to account for context that matters to them. This results in

resistance from the participants, consequently leading to the removal of features or the entire WT. In contrast to Allain et al. (2021), these findings reveal how calculative practices are not reinvented when they face resistance, rather, they are abandoned.

6.2 Limitations

We acknowledge three main limitations to our study. The decision to use a cross-sectional study enabled us to get insights from eleven participants providing insightful understanding of WT. However, the findings stemming from these interviews only capture individuals' perception and usage of WT at a single point in time. Although questions were asked about historical use and how it has changed over time, a longitudinal study could be beneficial to avoid recency biases. Secondly, the WTs used among participants differed in both model and brand, including Garmin watch, Oura ring and Apple watch, where some had different models from the same brand. Amongst these alternatives, how data is presented to the individual differs to some extent (e.g., visuals and tone). This variation, in addition to varying accuracy across models, could potentially influence human-technological relationships. Thirdly, as interpretative research suggests, the conclusions in this study are shaped by our own analytical lenses. The data collection process may have been steered towards certain themes in advance since postphenomenology shaped the creation of our interview guide. We recognize that a different theoretical framework could lead to different conclusions.

6.3 Future Research

Apart from accounting for potential recency bias, future research should consider conducting a longitudinal study to examine how human-technology relationships evolve over time. The findings highlighted that the relation could shift among hermeneutic, alterity, and background over time. Since the type of relation of mediation was found to be a key factor in the creation of the calculating self, to deepen the understanding of WT as a calculative practice, we suggest studying this relation over time. Although this thesis emphasizes research regarding calculative practices that transcend organizational boundaries, future research could additionally examine the role of WT within organizations. Given that WT has started being tested as a tool in the workplace, research should examine its implications within the domain of accounting (Insider Studios and PWC, 2021).

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8. Appendices

8.1 Interviews Conducted

Interviewee*	Date of interview	Length of Interview (minutes)
Participant 1	2026-03-12	29
Participant 2	2026-03-20	25
Participant 3	2026-03-24	23
Participant 4	2026-03-29	34
Participant 5	2026-03-30	40
Participant 6	2026-04-07	41
Participant 7	2026-04-08	30
Participant 8	2026-04-08	37
Participant 9	2026-04-08	40
Participant 10	2026-04-15	46
Participant 11	2026-04-29	36

*Interviewees have been fully anonymized

8.2 Interview Guide for Pilot Interviews

Introduction

1. What devices do you use to track aspects of your life?

2. How often do you interact and/or check with the data generated by these tools?
 - a. How do you typically use the data that wearable technology/ tools generate?
(review it regularly, set goals, compare to previous)?
 - b. Do you pay more attention to certain metrics than others? If that is the case, which ones and why?
3. How important are the metrics / data in your everyday life?

Motivation

1. What initially made you motivated to start using a wearable technology?
2. What motivates you to keep using wearable technology?
3. Do you set personal goals based on the data from the device?
 - A) **If yes**, what type of goals? Do you follow up on them regularly? What happens if you do not achieve the goals set? How do you feel when you reach or fail to reach these targets?
 - B) **If not**, why?
4. Do you compare your results/ data/ targets with others?
5. How do you feel encouraged by the data generated by wearable technology? Why or why not?
6. Do these metrics generated by your wearable technology ever make you feel pressure? If yes, in what way? Is it the data or the goals that are the issue? Why?

Behavior when using the WT

1. Have the wearable technologies changed any of your habits or routines? In what way? Do you feel that it has changed for the better or the worse?
2. Can you describe a situation where the data from the device influenced a decision you made?
3. Do you ever adjust your behavior to generate better scores from wearable technologies? In what way? Why not?
4. Do you ever think of the numbers previously generated when not checking the device? I.e., sleep score before going to sleep, or similar aspects?
5. Do you think these numbers generated by wearable technology make you more aware of your behavior and performance? In what way? Why not?

6. Can you describe a situation when you have ignored the numbers or neglected them?

Conclusion

1. In what ways would you like to use wearable technologies in the future?
2. Is there anything else about using wearable tracking technologies that you think is important, but we haven't discussed?

8.3 Interview Guide for Interviews

1: Introduction

1. What wearable do you have?
 - a. What can you measure with that particular wearable?
 - b. What aspects of your life/ kind of things do you measure?
2. How much do you use your WT?
3. Can you give me an example of when you checked your data the last time? What was the reason for doing so?

Relationship with the device

4. How would you describe your relationship with your WT? When do you feel most aware of its presence, and when do you not notice it?
5. How often do you interact and/or check with the data generated by these tools? What does that depend on?
6. Do you pay more attention to certain metrics than others? If that is the case, which ones and why?
7. What initially made you motivated to start using wearable technology?
8. Would you say your motivation is the same now or has it changed in any way?

3: Technology as a mediator

9. When it comes to feeling how you are doing, how does that process usually look?
10. When the device gives you a specific data point, what do you usually do with it? What are your thoughts? (review it regularly, set goals, compare to previous)?
11. Can you describe a time when you felt great, but the device gave you a "poor" score (or vice versa)?

5: Behavioral change

12. Does your device suggest a specific way of living for you? What does it consider a "successful" day?
13. Have you experienced any situations in which you changed your mind due to the fact that you wear a WT?
14. Have any of your routines or habits changed after introducing your WT? If so, in what way? Is it better or worse in your opinion?
15. Do you feel like you are the one making these decisions, or do you feel like the device is making the decisions for you?
16. How does the data generated by the WT make you feel?
17. How important are the metrics / data in your everyday life?

Concluding reflections

18. Looking back at life before the wearable, has your way of living changed in any way, and if so, how?
20. In what ways would you like to use wearable technologies in the future?
21. Do you consider your quality of life to be improved or worsen after starting using the WT?
22. Is there anything else about using wearable technologies that you think is important, but we haven't discussed?

8.4 Table of Coding Process

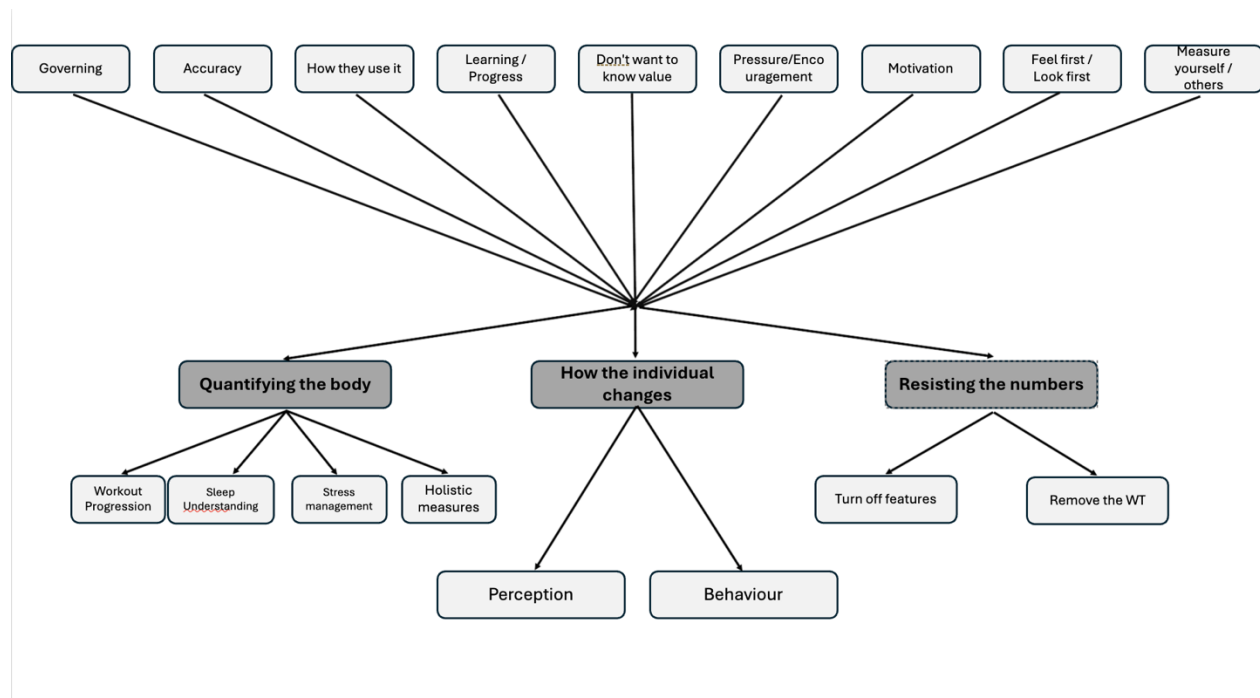


Figure 1: Coding process

8.5 Use of Generative AI

Writing Aid:

The use of generative AI has been in accordance with the guidelines at SSE. We have used ChatGPT version 5.5 and Claude Sonnet 4.6 to amongst other things receive feedback on our text in the form of refined formulations and making transitions between different parts of the thesis clearer. Furthermore, Generative AI has helped us improve clarity of the text, detect grammatical errors, and refine sentence structure.

General Usage:

Generative AI has helped us brainstorm in the initial stages of our research process. Furthermore, it helped us to understand complex philosophical concepts during our research process. Later in the process, Generative AI further served as a sounding board as we refined our research scope. Throughout the process, we have been aware that large language models can hallucinate and

hence critically evaluated all output from Generative AI before considering any suggestions made. Generative AI was not, at any point, used for data analysis or coding, and no original content from the models have been included in this thesis.

Representative Prompts Used During This Process:

Without altering any of the information in this section and not inserting any new information, could you evaluate and suggest improvements regarding flow? [insert section of text]

Can you please provide me with a prompt for the following topic to insert into Google Scholar in the following journals? [Insert description of topic + preferred journals]