

MUNDANE SELF-TRACKING: CALORIE COUNTING PRACTICES WITH MYFITNESSPAL

by

Gabija Didžiokaite

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To my Parents

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ABSTRACT

This thesis investigates self-tracking practices of users of MyFitnessPal calorie counting app. The thesis researches ‘everyday self-trackers’ – users who have started using the app on their own and are not part of any self-tracking community and focuses on the practices of self-tracking.

The thesis responds to the literature on self-tracking that has often neglected everyday self-trackers and practices of self-tracking. First, many studies, whether sociological investigations or human-computer interaction research, focus on members of Quantified Self (QS) community (Choe, Lee, Lee, Pratt, & Kientz, 2014; Li, Dey, & Forlizzi, 2010; Neff & Nafus, 2015; Sharon & Zandbergen, 2016). QS is a community of individuals who are interested in learning more about themselves through, oftentimes unusual and complex, self-tracking, which involves modification of existing technologies or even creation of new ones. Thus, focusing on QS members neglects the individual everyday self-trackers, their experiences and practices. Second, existing studies have mainly focused on health or social implications of self-tracking (Lupton, 2012b, 2013d, 2014a, Swan, 2012b, 2013). These include, but are not limited to, potential of self-tracking to assist diagnosis (Wile, Ranaway, & Kiss, 2014), or behaviour change (Chiauzzi, Rodarte, & Dasmahapatra, 2015), self-tracking increasing surveillance, public pedagogy (Rich & Miah, 2014) and subjection to neoliberal values and promotion of healthism (Lupton, 2012b, 2013a) or leading to monetisation of exercise (Till, 2014). While these studies have yielded important insights, they do not help us to understand what people actually *do* when they self-track, i.e. what *practices* self-tracking involves and how people engaged in self-tracking manage them. Guided by the STS approach that highlights the importance of

observing the mundane practices and need to focus on technology users, this thesis explores the practices of everyday self-trackers.

The exploration of the practices of self-tracking among the everyday self-trackers is based on 31 interviews with early mid-life individuals, who were mainly recruited from gyms and shared their self-tracking experience of using the MyFitnessPal calorie counting app.

The analytical chapters answer three questions: What is self-tracking by calorie counting in the everyday like? How is self-tracking by calorie counting done? What are the practices through which self-tracking affects those engaged in it? To answer the first question, I juxtapose self-tracking goals, use and effects as they are represented in the literature on the QS to those of my participants. Doing this reveals that self-tracking in the everyday is perceived and done quite differently than the QS metaphor would allow us to believe. The goals of the participants are mundane (weight loss), they do not use the sophisticated features of the app and are not interested in the historical data, the effects of the app are not life-changing and temporary – closely tied to the use of the app. This stands in contrast to QS metaphor where self-tracking is geared towards continuous self-improvement, driven by intricate data analysis and biohacking.

To answer the second question, I focus on self-tracking by calorie counting with MyFitnessPal as a dieting practice. I explore how self-tracking affects the daily practices as well as is incorporated in participants' lives. The users, thus, aim to find an approach to temporal aspects of tracking and precision that would fit most conveniently with their other daily practices. They manipulate their use of the app to accommodate any meals that are not in their usual dieting routine. This highlights that dieting through self-tracking is not a straightforward data collection and involves practical strategies and negotiations, and can both influence and be influenced by other everyday practices.

The third question focuses on quantification, that is ‘the production and communication of numbers’ (W. N. Espeland & Stevens, 2008, p. 402). Quantification has usually been discussed at institutional levels, in terms of government, science or, in the case of Espeland and Sauder’s (W. N. Espeland & Sauder, 2007) seminal work, in terms of academic rankings. I adopt the insights from these studies to make sense of the quantification at the individual level using MyFitnessPal. I draw out two features of individual quantification that distinguish it from institutional one, mainly that quantification is done for oneself only and it relies on self-governance. Further, I outline how quantification affects such decisions as whether to eat, what to eat and how much to eat. Quantification also works as commensuration as participants compared different foods referring to their calorie value. However, unlike in the case of institutional quantification, individual quantification did not have to be accepted unquestionably and often other values of food would be weighted in relation to calories when participants’ made choices what to eat.

Ultimately, this thesis contributes a new perspective on self-tracking as it explores the mundanity of it. It adds fine-grained insights into the everyday practices of self-tracking by adopting a novel analytical angle that centres on practices and by exploring a neglected user group of everyday self-trackers.

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CHAPTER 1

INTRODUCTION

The practice of self-tracking with the help of mobile and online technologies is becoming more popular. For example, many smartphones now come with pre-installed health apps – like Google Fit and Apple Health – that track steps taken, distances walked and other activity and health measures. Furthermore, armband pedometers, such as FitBit or Jawbone, as well as their more technologically advanced brothers – smart watches, such as Samsung Gear – can be spotted on many Westerners’ wrists. Forecasts predict a yearly increase in numbers of these and similar technologies shipped worldwide (Statista, 2015).

Self-tracking is, however, not a new phenomenon. Indeed, people have been writing diaries and collecting various information about themselves throughout history. For instance, already in the Antiquity, the use of *hupomnemata* – essentially notebooks recording valuable insights, whether heard, read or thought – was encouraged for future meditation or overcoming difficult episodes (Foucault 1997). Fast-forward to the Enlightenment; we have Thomas Jefferson inventing a simple pedometer (Copelton, 2010). That said, the trends discussed above indicate that self-tracking is becoming much more widespread. This applies in particular to technology aided self-tracking.

The growing popularity of self-tracking today can be explained by several reasons. For one, Internet-enabled electronic devices have become abundant and even indispensable in our lives. A closely related reason is that sensors and other advanced technology allow collection and processing - often seamless - of a range of data on a large scale. All this makes the process of self-tracking easier, and arguably more interesting to the user.

Self-tracking technologies range from those targeted at specific groups of users, to those aimed at the general population. As an example of technologies specialised for particular users, consider devices for sports professionals. For instance, cyclists or swimmers can find devices geared specifically for them, which will collect a variety of data on their performance and can sometimes give specific advice on how to improve it. At the same time, many self-tracking technologies are intended for the general public. In this domain, one of the most popular information to track is steps taken. There exist various armbands and clip-on devices, as well as apps on smartphones, targeting this activity. These technologies can tell their users how many steps they have taken, allow them to set up goals and show graphs of activity levels through time. Sleep tracking is another option of effortless tracking which can be done by using a special device or simply one's smartphone. By tracking sleep, one can learn about the hours of REM sleep, whether they were restless, how many times they supposedly woke up and receive general sleep quality evaluation. Another daily routine that has been subjected to tracking is eating. Some technologies suggest tracking eating by taking pictures of every meal eaten, others include diary notes, and yet others also calculate calories and nutrients of the meals. This is often aimed to help users be more aware of their eating habits and to achieve a healthier diet. One common aspect of various self-tracking technologies is that the abundance of such technologies and their use has sparked a keen interest and even concern among academics.

1.2 The previous studies of self-tracking

Self-tracking has been the subject of intense research, resulting in a multitude of studies (for example Harrison, Marshall, Bianchi-berthouze, & Bird, 2015; Li et al., 2010; Lupton, 2015, 2016b; Neff & Nafus, 2015). Existing literature can be broadly seen as researching a particular group of people, mainly Quantified Self (QS) community members, people

participating in technology research or people experiencing health issues. Moreover, the research is mostly focused on a set of topics like the experiences and implications of self-tracking. I distinguish my work from the current literature on self-tracking precisely on these two points: the analytical angle of the study and the people studied. In what follows, I will outline how these two points are covered in the following sections.

Many studies are researching self-tracking by exploring the implications it has on the user, healthcare and/or society at large. For instance, several of the very first papers on self-tracking were written by technology expert and entrepreneur Swan (Swan, 2012a, 2012b). In these papers, she explores self-tracking promises, noting that through collection and availability of data that was previously inaccessible to individuals, self-tracking enables ‘capabilities that are not possible with ordinary senses’ (Swan, 2013: 95). Swan argues that many self-trackers have found implementable solutions in areas that the traditional health system would never have studied or applied to their specific case (Swan, 2013). Thus, in this case, self-tracking helps to deal with personal issues and also extends the reach of healthcare systems.

While Swan’s argues for an optimistic, improved future with self-tracking, many others have taken a more critical approach to self-tracking. For example, Lupton argues that technologies of self-tracking can be perceived as one of the governing ways that greatly highlights the individual responsibility for the personal well-being. To quote Lupton, self-tracking technologies can be seen as conforming to ‘the entrepreneurial, self-regulating subject that is represented as the ideal responsible citizen in neoliberal societies’ (Lupton 2012, 235). She also adds that promotion of self-tracking for the achievement of good health promotes what Crawford (1980) referred to as the discourse ‘healthism’ – where attainment and maintenance of good health become the most important goals in life (Lupton, 2013a). Such a view on health reduces health problems to the individual level,

glossing over the structural inequalities and socioeconomic determinants (Lupton, 2012b, 2013d, 2014a). Moreover, while self-tracking might be praised by medical professionals for encouraging self-care and prevention, it is often forgotten that it requires resources that are not easily accessible by all (Lupton, 2012b, 2014b).

Similar observations have been made by Rich and Miah (2009, p. 168), who state that various digital tools ‘expand the surveillance and disciplinary power (Foucault 1977) of the medical gaze’ and offer new ways for people to perceive their bodies. They add that mobile health technologies can be seen as vehicles for public pedagogy. Indeed, their analysis of public pedagogy within digital social spaces show technologically mediated health sites as providing biopedagogy (Rich & Miah, 2014). Researchers have also addressed the employer-organised self-tracking. For instance, it was noted that once exercise becomes quantified in the workplace, it acquires monetary value and thus becomes work for which employees are not remunerated (Till, 2014). The studies on self-tracking mentioned above witness that the focus of research is on the implications self-tracking has on the user, healthcare and/or society at large. Meanwhile, regarding research on people engaging in self-tracking, a lot of the discussion veers around examples based on the community of Quantified Self (QS).

In 2007 enthusiasts of self-tracking established Quantified Self (QS) community. QS started in San Francisco, by two Wired magazine editors to help people share their self-tracking tools and experiences. Since then, it has expanded and involves communities all over the world. QS organises two annual conferences and local meetup groups, where people engaged in self-tracking come to talk about the things they are tracking, how they are doing it and what they have achieved. An ethnographic research on the group has revealed them as having unorthodox views of health, establishing and relying on individual health norms (Nafus & Sherman, 2014). Human-computer interaction (HCI)

researchers have analysed some QS meetup videos and found the QS members as often creating new technologies or tinkering with existing ones and being inventive with data analyses (Choe et al., 2014; Li et al., 2010; Whooley, Ploderer, & Gray, 2014). In response to critics that perceive QS members as ‘data fetishists’ (Dormehl, 2014; Morozov, 2013), Sharon and Zandbergen (2016) argue that QS members engage in different forms of the meaning making of their data, engaging in self-tracking as mindfulness, resistance and communicative aid. Neff and Nafus (2015) also respond to the misconception of QS community as obsessed with data, by providing an introduction based on their time spent within it and offer advice on how to successfully engage in self-tracking in the way QS members would.

In addition to the QS community, other groups of people engaging in self-tracking have been studied. For instance, health studies testing new self-tracking technology often ask people who are suffering from one or another health issue to use and evaluate the technology (Kawagoshi et al., 2015; Normansell et al., 2014; for example Pludwinski, Ahmad, Wayne, & Ritvo, 2015). However, health research often wants new self-tracking technologies to target chronic conditions and the people involved in such studies are usually given these technologies rather than been using them themselves. Hence, health studies provide insight into the use of self-tracking by particular groups (like chronically ill) and by those who might not be interested in self-tracking if not for their involvement in the research.

1.3 Rationale of the present thesis

The review of available literature indicates that a larger portion of the literature on self-tracking focuses on its wide-scale impact and/or on a rather exceptional group of users. This approach has two main drawbacks. First, it neglects the practices of self-tracking in

everyday contexts. Second, it disregards users that are not part of QS or other group and have taken up self-tracking on their volition. Therefore, with this thesis, I aimed to provide a better knowledge of self-tracking practices in everyday context as it is done by users who are not part of a self-tracking community. In particular, the present thesis sets out to explore calorie counting as self-tracking by focusing on practices and the viewpoint of ‘everyday self-tracker’.

The research questions that I wanted to answer crystallised inductively from a combination of the material and the literature – both when still conducting interviews and when the data collection was finished (more on the analysis in Chapter 4). The research questions are as follows:

- What is self-tracking by calorie counting for those engaged in it?
- How is self-tracking by calorie counting done?
- What are the practices through which self-tracking affects those engaged in it?

Each of these questions is discussed in the analytical Chapters 4, 5 and 6 respectively.

Each of the questions, and, therefore, each of the chapters, gives a separate, individual insight into self-tracking practices; however, taken together they provide a wholesome picture of self-tracking by calorie counting and highlight the everydayness of this practice.

1.3.1 PRACTICES AS THE FOCUS OF RESEARCH

Instead of focusing on social implications of self-tracking or views of the users, I focus on practices. As indicated earlier, this analytical angle is not taken by earlier research; however, it allows to acquire an understanding of *how* self-tracking is actually done, what it requires from and means to those involved in it. In particular, while studies have indicated that self-tracking technologies can extend our senses as well as promote

neoliberal ideas about personal responsibility for one's wellbeing, it remains unclear how this is enacted on the level of everyday use.

The focus on practice is inspired by the science and technology studies (STS). Particularly the ethnographic laboratory studies (Latour, 1987; Latour & Woolgar, 1979) and works on technology (Bijker, Hughes, Pinch, & Douglas, 2012; Bijker & Law, 1992), especially from the user's perspective (Oudshoorn & Pinch, 2003).

As Amsterdamska (2008, p. 205 my emphasis) notes, STS laboratory studies shifted scholarly attention from 'science as *a system of ideas* or beliefs produced by a social institution to a conceptualization of science *as a set of practices*'. STS researchers aimed to question the permanency and universality of science and its facts. Observing and describing what it takes to establish something as a scientific fact helped STS scholars achieve this goal as this facilitated revealing the contingent nature of scientific work. This focus is close to my aim of unpacking the existing image of self-tracking by exploring the daily practices it requires. I aim to move the analytical angle of self-tracking research from *thinking about* self-tracking to explorations of how self-tracking is *done*.

However, this shift in STS described by Amsterdamska (2008) is not just a methodological one. The focus on practices required 'observing the mundane, everyday activities of scientists' (Amsterdamska, 2008, p. 205). This is mainly because the mundanity and messiness of scientific practice are usually glossed over and forgotten in the final reports and textbooks that describe scientific research. Yet the mundane is where the negotiations take place, as scientists need to find agreements about best measurements, solutions and representations related to their findings before being able to announce them as solid facts. Similarly, I want to unpack the neat image of self-tracking that features in existing research to explore the everydayness that self-tracking is grounded in. This

means discussing actions that might be neglected by research and perceived as irrelevant by those being researched.

The classic study of ‘laboratory life’ by science and technology scholars Latour and Woolgar (1979) was provoking at the time of its publishing as it adopted anthropological methods to study science and scientists. They argued that to understand how science is done is not enough to ask scientists, but is essential to investigate how scientific ‘practices are organised into a systematic and tidied research report’ (Latour & Woolgar, 1979, p. 29). Through this approach to science, Latour and Woolgar (1979) showed how scientists produce order in their otherwise disorderly practices of constructing scientific facts. Hence, they highlight the idea that science is *done* and facts are *achieved* through myriads of practices and negotiations.

Similarly, in his exploration of ‘science in action’, Latour (1987, p. 4) makes his entry ‘through the back door of science in the making, not through the more grandiose entrance of ready-made science’. Doing this and studying science in practice, rather than the facts it offers, helps Latour to open the ‘black boxes’ – unravelling the decisions, negotiations and details that have made double helix of DNA a fact. While his approach has been criticised for being uncritical about the practices studied (Amsterdamska, 1990), Latour’s work on ‘science in action’ makes a case for studying practices as constitutive parts of social phenomena.

Another strand of STS work that inspired my approach in this thesis is that which studies technology use and users (Bijker & Law, 1992; Oudshoorn & Pinch, 2003). Their rejection of technological determinism – an idea that technologies develop and evolve in linear, predetermined fashion – requires investigation of *how* technologies are being developed and used (Bijker & Law, 1992; MacKenzie & Wajcman, 1999). Those who

focus particularly on users and use also reject ‘the essentialists views of users’ identities’ (Oudshoorn & Pinch, 2003, p. 2). In order to understand how technologies are being used and by what kinds of users it is important to study technologies in their ‘contexts of use’ – actual contexts they are used in practice, among other objects and people (Oudshoorn & Pinch, 2003, p. 2).

A study of an ambulatory ECG monitor use by Oudshoorn (2008) is not only a good example of user-focused technology study, but it also offers a new way of thinking about practices that technology use requires. Building on the Star and Strauss’ (1999) exploration of what counts as work, Oudshoorn extends the inquiry into ‘invisible work from occupational contexts to situations outside formal work relations’ (Oudshoorn, 2008, p. 275) by studying the work that use of ECG monitor required from the patients, nurses and doctors. She notes the ways patients tried to integrate the technology into their daily lives, and how nurses and doctors played a role in supporting them. This invisible work, thus, helped patients in adopting the role of ‘diagnostic agent’. The idea of invisible work as extended to the use of technology outside the workplace is particularly relevant for the present research as it highlights the effort required for someone to engage in self-tracking and calls for unpacking of self-tracking and understanding the practices it entails.

I am guided by these practice-oriented traditions in STS in my wish to understand the users of self-tracking technologies, how self-tracking is done and what practices constitute it. I reject the deterministic view of self-tracking technologies and essentialists views of those who engage in the practice, which can be found in media (Cha, 2015; Weintraub, 2013) and even academia (Swan, 2013). Furthermore, similarly to studies discussed above, I aim to understand users views and practices as they happen in the everyday context. This is important if we want to study the *actual* practices and explore the mundane. Finally, instead of taking self-tracking as a given, stable entity, I seek to open the ‘black box’ of

self-tracking: to understand the practices that enable and constitute self-tracking on a daily basis by those who engage in it.

To explore the practices of self-tracking, I discussed with the participants of my research how they do self-tracking, focusing on topics that range from the timing to strategies helping them deal with the lack of information. I also discussed rationale and story behind their use and asked participants to evaluate the usefulness and practicality of the app, use of which I was researching, mainly MyFitnessPal. The focus on the practices led the findings to concentrate on the ‘everydayness’ of self-tracking immersed in the daily practical considerations and effects that have so far been neglected by research.

1.3.2 RESEARCHING THE ‘ORDINARY’ USER

Drawing on De Certeau (1984) and Schutz & Luckmann (1973), Bakardjieva and Smith (2001, p. 68) in their work on early Internet users used the term ‘ordinary man and woman’ to identify the kind of user they were interested in. That user was playing ‘no role as a professional (engineer, programmer, designer, etc.) and/or decision-maker in the industrial, commercial or service sectors developing computer-networking technology’ (Bakardjieva & Smith, 2001, p. 68). Few researchers have addressed the perceptions and experiences of such self-tracking users. I discuss several examples of such studies next.

One example of research exploring ‘everyday self-trackers’ is Rooksby et al. (2014) study which interviewed people who used activity trackers. There, authors found that preferences and habits of tracking depended highly on ‘people’s lives, worries, hopes, interests, careers’, making the tracking activity ‘his/her own’ (Rooksby et al., 2014, p. 1171). More specifically, apps were often used for short periods to help achieve long-term goals. In addition, most participants, unlike the QSers who are interested in the development of data, saw tracking as ‘prospective rather than retrospective’ (ibid.) Based

on these findings Rooksby et al. (2014) introduced the term ‘lived informatics’ underscoring that ‘people are using information and finding its meaning in their day-to-day lives’, as opposed to personal informatics where rational users require validated and analysed data to act (ibid.)

Another study by Fritz et al. (2014) conducted interviews with long-term users of activity trackers. They found that users lose their initial enthusiasm over time. Nonetheless, participants were attached to numerical goals and data, noting that technologies motivated them to be more active and made them make durable behavioural changes with some participants rewarding themselves for some device-related achievements.

As another example, Cordeiro et al. (2015) surveyed food journalers and analysed posts in community forums of three mobile food journals. Again, researchers found that journaling was geared towards a specific goal, with use discontinuing after it is achieved. Journaling made many participants ashamed of or obsessed with their food choices.

The present research aims to contribute to the latter group of studies as it explores the everyday practices of self-tracking use among ‘ordinary’ people using MyFitnessPal calorie counting and diet tracking app. I build on Bakardijeva’s and Smith’s (2001) definition of ‘ordinary user’ to whom I refer to as ‘everyday self-trackers’: people who have downloaded or purchased an app (in my case, MyFitnessPal) and are using it on their own without belonging to any movement. I have chosen this user group as I assume it to be more representative of wider trends of self-tracking use than QS members or people who are asked to self-track for research purposes. Hence, I wanted to know more about the other kind of users, those who are not participating in the QS and their meetings, not discussing self-tracking online, but are simply counting their steps, exploring their sleep or other variables, individually. To find these people I had to avoid QS and other

communities and search for the individual trackers. Recruiting was not an easy task (further on this in Chapter 4) as it was challenging to find individuals, rather than communities, and approaching individuals rarely led to snowballing. Nonetheless, through personal trainers, gyms, sports groups and university message boards I managed to interview 31 individuals about their experience of self-tracking with MyFitnessPal.

The self-tracking technology I chose to focus on in this thesis is MyFitnessPal – a calorie counting and diet tracking website and an app – vowed as one of the best self-tracking technologies by tech and fitness websites (Duffy, 2015; Greatist, 2015). MyFitnessPal website was co-founded by Mike Lee in 2005 when he wanted to lose weight before his beach wedding and found the pen and paper diary too complicated. Soon MyFitnessPal website proved very popular, and in 2009 with iPhone hitting the market, MyFitnessPal app was launched. MyFitnessPal works by suggesting users a daily calorie intake limit based on their current and goal weight, their gender and their activity level. It relies on a mechanistic understanding of the body, and the first law of thermodynamics that states that total energy of an isolated system is constant; energy can be transformed from one form to another, but cannot be created or destroyed. In other words, energy (calories) in/energy (calories) out – to lose weight one needs to burn more calories than consumed through food, so that body fat (stored energy) would burn.

Using MyFitnessPal means logging everything that you eat and drink either by scanning the product's barcode or by searching MyFitnessPal database. Users also must select the quantity that was eaten to get the precise calorie count for the meal. It is also possible to track calories burnt through exercise, and the app increases the daily calorie allowance if users log any calorie burning activities. MyFitnessPal's has assets such as database boasting five million food items, barcode scanning for easier input of data, synchronisation with other self-tracking technologies and since 2015 it is offering paid

premium services that help to track in more detailed manner. Despite requiring manual input, in 2016 the app's description on iTunes and Google Play claims it is 'the fastest and easiest-to-use calorie counter' (iTunes, 2016).

MyFitnessPal requires quite a lot of interaction from the user and thus entails more practices. Moreover, it is presented as a food diary, a dieting tool, rather than a self-tracking tool and thus attracts people who are not necessarily interested in self-tracking in the way that QS members would be. These two features of the app make focusing on it particularly useful for reaching the aim of my study.

1.4 Outline of the chapters

I begin with an outlook of literature on self-tracking (Chapter 2). The literature I outline comes from a variety of disciplines and explores self-tracking from different angles. Therefore, to structure the literature review, I have divided the literature accordingly to the discipline (HCI, health research, social sciences) and research perspective (conceptual works, user studies).

Chapter 3 provides a historical outline of the development of science around calorie and nutrients as well as the creation of such body quantification tools as BMI and height and weight tables. With this chapter, I intend to ground calorie counting as everyday, non-surprising practice that is based on the 19th and 20th-century scientific ideas about body and nutrition that have successfully made their way into our kitchens and understanding of ourselves.

This is followed by an explanation of methodological approach that I have adopted in the research for this thesis (Chapter 4). I give details about the grounded theory method on which I base my ontological and epistemological stance in this research. Further, I describe the recruitment, data collection and reflect on my experience of and influence on

the data collection and research in general. I finish with a description of the process of data analysis.

The first analytical chapter (Chapter 5) aims to explain what self-tracking meant to my research participants and compares it to the QS metaphor that is prevalent in the discussion of self-tracking. In this chapter, I build on the work of Ruckenstein and Pantzar (2015), who have demonstrated how our understanding of self-tracking has been influenced by the metaphor of the Quantified Self. To complicate this very selective picture of self-tracking, I shift the focus in understanding self-tracking from members of the QS community to the experiences of ‘ordinary man and woman’ (Bakardjieva & Smith, 2001). I, therefore, interviewed ‘everyday calorie trackers’ - people who had themselves started using MyFitnessPal calorie counting app but were not part of any tracking community. The analysis identifies three main themes – goals, use and effect – which highlight the mundane side of self-tracking, where people pursuing everyday, limited goals engage in basic self-tracking and achieve temporary changes. These experiences contrast with the account of self-tracking in terms of long-term, experimental analysis of data on the self or ‘biohacking,’ which dominates the QS metaphor in the academic literature.

In Chapter 6 I present how self-tracking is done – what considerations calorie counting requires and how it interrupts with daily habits. I analyse this in the context of research on fatness and weight loss. The existing literature on fatness has critically discussed meanings and morals associated with body weight and explored people’s experiences of weight loss attempts. However, little attention has been paid to the practices of dieting – how it is ‘done’. Based on the interviews on self-tracking with MyFitnessPal, I focus on the practices of ‘doing’ calories. First, I discuss the practices of temporality of logging food, showing that the use of MyFitnessPal not only has to be fitted into daily routines but can

also transform them. Then, I look at the practices of precision or users' various ways of turning the 'messiness' of food into precise numbers. Lastly, I explore users' practices of manipulation – their attitudes to adherence to their daily calorie goal and ways of dealing with going above it. Based on these findings I suggest calorie counting is not a straightforward data collection, but one that involves constant practical strategies and negotiations, and can both influence and be influenced by other everyday practices.

The last analytical chapter (Chapter 7) aims to describe the effects of self-tracking by calorie counting on those engaged in it by exploring self-tracking as an everyday practice of quantification. Quantification is a topic often discussed by researchers studying government or science. It is also analysed in seminal pieces on law school rankings which question working and purpose of rankings in general (W. N. Espeland & Sauder, 2007; Sauder & Espeland, 2009). I refer to this as institutional quantification. However, researchers have noted that quantification is encountered in our individual daily lives. Nonetheless, the quantification that is done and is encountered daily by individuals going about their routines has been minimally explored. Hence, in this chapter, I provide an insight of individual everyday quantification as it is done with MyFitnessPal. First, I explain why self-tracking with MyFitnessPal should be understood as individual quantification – mainly because it is done for oneself and relies on individual self-governance. Second, I explore the everyday realities of quantification. I focus on the effects that quantification brings on the individual decisions, particularly about whether to eat, what to eat and how much to eat. I discuss how quantification works as commensuration and show how when exploring individual quantification I noticed its limits – the stories of participants show how they incorporated quantification in their decisions and that it was not always the deciding factor. This stands in contrast to the usual understanding of quantification when represented by institutional quantification.

I conclude the thesis with Chapter 8. Here I provide a summary of research findings. Then I evaluate how the research aims and questions have been addressed. I discuss the findings of this thesis, how they relate to current research on self-tracking and what they add to it. Lastly, I consider the limitations of this research as well as possible paths for future research.

CHAPTER 2

WHAT WE KNOW ABOUT SELF-TRACKING

2.1 Introduction

Though technology-guided self-tracking is a relatively new phenomenon, the literature on it is wide and growing. It covers various aspects of this phenomenon ranging from the design of technologies to policy implications. In this chapter, I will outline the literature, its main arguments and how it relates to the present research. Lomborg and Frandsen (2015, p. 3) argue that research literature on self-tracking three bodies of literature can be distinguished: ‘(a) health care and (b) interaction design and systems development research, and (c) the implications of self-tracking have been discussed under a critical-sociological lens in terms of surveillance, labor and loss of privacy.’ I will present the literature accordingly by reviewing literature from healthcare research, Human-Computer Interaction (HCI), and social sciences. The structure not only provides a clear way of grouping the available studies but also serves as an indicator about which studies are more relevant to my work – starting with health care studies as the least relevant and finishing with social research as the most pertinent.

As this classification of main bodies in self-tracking discussion perfectly distinguishes the different kinds of literature the present research is influenced by, I follow this classification in this literature review. Moreover, since I am looking into practices of self-tracking among everyday self-trackers, studies of different disciplines cover various aspects of my interests. Thus, these fields taken together help to identify the gaps in the literature and build an informed research.

The health care studies of self-tracking are the most numerous; however, they are the least relevant for the present research because of their focus on particular populations and their behaviour change of that self-tracking technologies are being made to drive. Furthermore, health care studies are aimed at improving technologies and its usability. Therefore, they focus on technical and experience-related issues, rather than practices. Health care studies' interest in barriers and facilitators and behaviour change is close to the aims of the thesis. Nonetheless, health care studies explore these topics in more of a narrow manner, mainly focusing on barriers and facilitators that could help enhance technology and adherence, and not investigating through what practices the effects emerge. A better understanding of use and practices is the aim of the present study, as I try to understand how people negotiate between what is possible and needed, both in terms of technology and their daily lives. I also aim to demonstrate how the effects of self-tracking develop.

The HCI studies are more relevant to this thesis, as they often use qualitative methods, focus on more varied populations and aim to better understand the use of technology. They are helpful for understanding motivations for engaging in self-tracking and for developing ideas about the different ways self-tracking is being engaged in (e.g. difference between users like QS members and everyday self-trackers) as well as aspects and features of self-tracking technologies users enjoy and dislike. Yet, the aim of these studies is often design-oriented in a sense, that they, similarly as health studies, are seeking knowledge to develop and improve technologies.

Lastly, the social sciences studies on self-tracking are closest to the aims of this thesis. Though most of the studies are conceptual and do not explore actual activities of self-tracking, they show the possible social impact that self-tracking could have on individuals and societies like embrace of healthism and individual responsibility for health. This is useful for thinking about self-tracking. However, the empirical social sciences studies are

more relevant for the aims of present research. Many offer valuable knowledge about people's who engage in self-tracking views of and experiences with self-tracking, which helps to understand better what self-tracking means for everyday self-trackers. Some studies particularly look at practices self-tracking entails, which is of particular relevance to this study.

Drawing on the insights from the three literatures above, this thesis takes a science and technology studies perspective because they offer valuable ideas that could be used as a lens through which self-tracking can be approached. I am particularly influenced by their focus on diversity of technology users, move from 'revolutionary' to 'normal' science, opening of the 'black-boxes' and focus on practices. Through the lens of these ideas, this thesis builds on the outlined works on self-tracking and aims to contribute new insights about practices of everyday self-trackers.

2.2 Healthcare research of self-tracking

Works on self-tracking coming from public health and related disciplines seem to be the most numerous from the three disciplines discerned. This is mainly because self-tracking can be seen as *self-monitoring* which has long been a point of focus in this field (Wilde & Garvin, 2007), but in the recent years has attracted increasingly more attention. This is well illustrated by the NHS launch of a fast-track funding for health apps and monitors that would be provided for patients because they have been shown 'to be cost-saving or help patients with supported self-management' (NHS, 2016). NHS collaboration with IBM and Google's Verily to design, implement and promote self-tracking among users of public health services suggests that both public and private sectors have high hopes invested in self-tracking.

Yet, although numerous studies on self-tracking come from healthcare, they are only somewhat relevant for the current study, as they focus on self-monitoring of particular groups such as chronically ill and also on self-tracking that is initiated by health professionals rather than the users. For this reason, I will give only a brief outline of this literature picking out the key findings and aspects that help to understand the current trends in this area and provide a wider context for the present thesis.

Healthcare studies on self-tracking aim to improve diagnosis, treatment or prevention of illnesses and cover an array of different conditions, which I aim to reflect in this short review. This instrumental approach to self-tracking and focus on very specific populations has little relevance to my thesis. Nonetheless, health studies aim to understand barriers and facilitators – which cover some practices – and effects. These are the topics I address in my thesis and, hence, healthcare research can provide me with some insight.

First, some of health studies have focused on self-tracking technologies' ability to assist diagnosis. Wile and colleagues (2014) explored the potential of a smartwatch with accelerometer (a device that assists in the tracking of steps or other movement) to help medical practitioners to distinguish between essential tremor and the postural re-emergent tremor of Parkinson disease. This study represents the appropriation of self-tracking technologies as medical and diagnostic devices that could be used in the clinic, as in this case the self-tracking device was adjusted for the purpose and was only worn for several minutes in a clinical setting.

As mentioned, self-tracking technologies are also being used for treatment and this is another focus of healthcare studies. A study used activity trackers attached to waist to monitor the activity of patients with multiple sclerosis (Shammas et al., 2014), the aim was to gather data on patients' actual activity levels, their type and intensity, as usually

this information was provided by the patients themselves and therefore rely on recall. The research showed that physical activity monitors were useful for tracking daily activity fluctuations and, therefore, changes in disability. Acquiring such individual data is useful for the development of personalised activity-based treatments.

As healthcare is increasingly shifting attention towards prevention of illnesses, technology-guided self-tracking is seen as helping to promote behavioural change.

Increasing physical activity is one of the focus of these studies (Chiauzzi et al., 2015).

Heesch and colleagues (2005) explored women's experiences in intervention to increase physical activity that used pedometers and included minimal contact with health

professionals. They found that wearing the pedometer made participants more motivated as they had tangible goals, this way it helped women to increase their physical activity.

The need to submit step logs to the intervention staff made participants more accountable and, therefore, more conforming to the intervention. As the present thesis is geared towards understanding the effects of self-tracking, health studies like this that focus on effects of the technology use are insightful. They show how participants respond to self-tracking and the changes it suggests. However, they studied only the goals which self-tracking technology is *intended* to achieve and they are not investigating through what practices the effects play out. The present thesis aims to focus on this – unravelling the self-tracking effects, to not only understand the vast range of effects that can emerge from self-tracking, but also the ways they achieved (or not) through practices.

Self-monitoring is of particular importance for people with chronic conditions, and, thus, health research studies often focus on how self-tracking could assist with specific illnesses. Research has explored the usefulness of self-monitoring on a smartphone for self-management of type 2 diabetes mellitus (Pludwinski et al., 2015). Qualitative interviews with patients who participated in the trial showed that people felt more self-

aware and self-managing as the need to log foods and activities made them think more about them and make a different choice. Participants felt more motivated by the feedback they were getting from health coaches that monitored their records, again indicating that only technology may not be sufficient for helping patients monitor themselves and change their behaviours. Still, this study showed self-tracking technologies as improving the communication with a health coach and subsequently self-management.

Self-monitoring has also been shown to be potentially effective support for self-management of HIV (Swendeman et al., 2015). Participants in the trial were asked to complete daily or bi-weekly surveys on their medication adherence, mental health, use of the substance, and sexual risk activities, and short diaries on stressful episodes by using smartphones or the Internet. Participants preferred daily surveys as they allowed them to think about more recent situations, and generally self-monitoring surveys were perceived as helping to be more reflexive, reinforcing regular medication taking, and as therapeutic because they allowed to express oneself without being judged. However, a third of participants thought that surveys were too long and dull, some were concerned about the privacy, especially when reporting sexual behaviours.

The three examples of self-tracking's involvements in healthcare illustrate that healthcare studies usually focus on particular user groups with people in those groups being asked to engage in self-tracking in order to study the usefulness of the technology. While valuable for the purpose it aims to address, it is not helpful in understanding *how* self-tracking is done and responded to when it is taken up in the 'wild' by people who buy self-tracking technologies from supermarkets.

Yet, these studies prove to be insightful to this thesis because of their focus on behaviour change. Though behaviour change was not my main research focus, I was interested to

explore how eating behaviours change during calorie counting and how long these effects last after counting is stopped. Thus, healthcare studies while not directly influential, provide useful insights into how self-tracking can lead to behaviour change, what aspects of it and the technology used people like, dislike and respond to.

2.3 Human-Computer Interaction research of self-tracking

Interaction design and systems development research is mainly conducted by the human-computer interaction (HCI) researchers. In HCI, where self-tracking is also called *personal informatics*, the studies usually focus on the technological and usability aspects of self-tracking technologies, seeking to improve them. The objects of tracking vary from waste (Thieme et al., 2012) to transportation behaviours (Froehlich et al., 2009) and physical activity (Lin, Mamykina, Lindtner, Delajoux, & Strub, 2006). In this section, I will present HCI works that cover subjects most relevant to the present research, mainly studies on QS members, studies on self-tracking of food and studies on non-QS self-tracking users. I group the HCI works in this manner as this allows to distinguish different interests that HCI researchers have and to highlight the points of convergence of HCI studies and present research.

2.3.1 STUDIES OF QS MEMBERS

QSers have captured the attention of academics, and several studies, mainly from HCI, have studied members of the QS community, though mainly through secondary sources. Choe et al. (2014), Lee (2014) and Whooley et al. (2014) analysed QS show and tell videos available on the QS website. Choe et al. (2014) and produced a comprehensive list of prevalent motivations for self-tracking (improving health or other aspects, new experiences through self-knowledge), identified common pitfalls of the users (lack of scientific rigour, tracking too many things, not tracking triggers and context) and reasons

for building custom tools (lack of tools to support specific needs or both track and explore data, ability to self-experiment) among the community. Lee (2014) also explored QSers motivations to self-track (related to ongoing personal interest, encouragement of family, concern for health, and professional interest), conditions that enabled participation in QS (QS knowledge exchanges, ease of use of tools, ease of integration of tracking to daily activities) and analyses of the data (identifying changes over time, finding central tendencies and comparing across conditions). Whooley et al. (2014) found that QSers were either goal or curiosity-driven, and depending on this they preferred different kinds of integration and representation. Li et al. (2010) surveyed both people from QS and other self-tracking websites, who engaged in various self-tracking practices from collecting bank statements to the tracking of work. Based on this data they developed a five-stage model of personal informatics systems: preparation, collection, integration, reflection, and action.

The studies discussed above were relying on secondary sources – like video recordings of QS meetups – and thus lack flexibility in the questions they can answer in their research. Their interrogation is driven by the aim to understand how self-tracking's technological side can be improved. Moreover, they focus on a particular user group. Despite these limitations, the HCI studies into QS members is useful for understanding the engagement in self-tracking, people's motivations, interests and patterns of use. Thus, while on the one hand researching very specific group like QS limits the generalisability of the insights, on the other hand, these findings allow to approach the less-researched territory of everyday self-trackers with some ideas of what self-tracking can mean and entail. Moreover, the insight into QS practices allows comparing them to those of everyday self-trackers', which in turn can help us to establish them as similar or separate groups, which require

respectively equal or different approach and evaluation. This is what I have done in this thesis (Chapter 5).

2.3.2 STUDIES OF FOOD TRACKING

Lister et al. (2013) examined food tracking from health research perspective. They gave iPads to university students asking them to track their diets using any of the apps on the Apple store. The size of iPads was perceived as a barrier for diet tracking, and the students preferred mobile phones. The poor reliability and accuracy of information provided by the apps were other barriers mentioned by the participants. Similarly, Cordeiro et al. (2015) interviewed with 28 participants who were asked to use a photo-based food journal for between 4 to 8 weeks. Focus on photos instead of calories (which were not included in food tracking) provided the broad context of the food consumptions (where, when, how, how they felt) which participants valued because often they could establish triggers and trends in their food choices. Taking pictures of food made participants more mindful of what they eat, as they did not want to capture ‘unhealthy’ foods. However, participants who had weight-loss goals though appreciated photos still found calorie information lacking. Cordeiro et al. (2015) conducted a survey with food journalers and analysed posts in community forums of three mobile food journals. Again, researchers found that journaling was geared towards a specific goal, with use discontinuing after it is achieved. The effort required to track food, detailing entries, unreliable databases, and difficulty of entering food from restaurants and friends were main technology-related barriers to journaling. The fact that pre-packaged meals were easiest to enter contrast to the ‘healthy’ eating ideals promoted by the app. Forgetting to enter the foods and not wanting to journal the food in the presence of others were also barriers. Journaling made many participants ashamed of or obsessed with their food choices.

Though as other HCI studies, research on food journalers focuses on technology, rather than the practices of the user, as the present thesis intends, this strand of research helps us to delineate what use of apps like MyFitnessPal might entail. Because I am interested in practices, the insights of Cordeiro and colleagues (2015) help me to understand what makes the process of food easier or harder, hence, possibly on what I should concentrate on. The group of people that Cordeiro and colleagues (2015) researched could be seen as being the everyday self-trackers that this thesis sets out to study.

2.3.3 STUDIES OF NON-QS SELF-TRACKERS

Thus far studies of users that are not members of any tracking community are relatively few. HCI studies on this subject constitute a fair part of all of them. Nonetheless, they have a variety of research aims, and I will discuss them by grouping them accordingly.

Some of the research focuses on the self-trackers' interaction with the technology and the collected data. Elsdén et al. (2015) explored the notion of quantified past and the importance of historical self-tracking data among some self-trackers. They described how participants performed data-work - 'the language and "work" that is required to qualify and make sense of one's data' (Elsden et al. 2015, 29). Yang and colleagues (2015) looked at how users evaluate the accuracy of self-tracking technologies. Found that users' satisfaction with accuracy (trueness and precision) varied as self-tracking devices did not satisfactorily attend to differences between different user characteristics (e.g., physical characteristics, bodily movements, activities types, and lifestyle), as well as their goals. Also, users did not have adequate knowledge of how these devices evaluate the tracked activity and, therefore, did not know how to assess data and measurement quality. Authors identified seven types of problems that users encountered as they sought to assess the accuracy of their tracking devices. Harrison et al. (2015) interviewed people who were

given a self-tracking device about the issues they encountered. Users complained about accuracy, social aspects of self-tracking were not always satisfactory and aesthetic, and comfort demands were often unmet. Authors discuss the workarounds that some people engaged in.

Other, the studies that are closest to the interest of the present thesis interviewed people using activity trackers who were not part of any community, in order to understand what made them interested in self-tracking and what drives their usage. Rooksby et al. (2014) interviewed people, who self-tracked physical activity. Participants frequently used apps for short periods to assist them in achieving long-term goals. Unlike the QSers, who are interested in collection and analysis of data, they perceived tracking as ‘prospective rather than retrospective’ (Rooksby et al., 2014, p. 1171) and did not look at historical data. Based on these findings, Rooksby et al. (2014) introduced the term ‘lived informatics,’ underscoring that ‘people are using information and finding its meaning in their day-to-day lives’, as opposed to Li’s et al. (2010) personal informatics, where rational users require validated and analysed data to act.

Fritz et al. (2014) conducted interviews with people using activity trackers. They found that users lose their initial enthusiasm over time. Nonetheless, participants were attached to numerical goals and data, noting that technologies motivated them to be more active and made them make durable behavioural changes with some participants rewarding themselves for some device-related achievements. Also, users often became dependent on the devices and felt irritated when they forgot to wear them and could not account for their activities. Only some of the participants engaged in the social features of their devices, with those engaging in them feeling more motivated and mainly sharing data with strangers. As self-tracking technologies are more prevalent among young and middle-aged adults, research into the older population is limited.

HCI studies on self-tracking users offer valuable insights into different aspects of engagement in self-tracking. More often than not they use qualitative methods, such as interviews, to gather their data, and thus can provide more in-depth information about the motivations, use, and end of use. What is often neglected, however, is an exploration of the practices, as the discussed studies mostly rely on experiences and evaluations.

Moreover, HCI research is geared towards utilitarian goals of improving the experience of self-tracking technology use. Whilst, I am interested in engagement in self-tracking in order to understand this endeavour better.

Nonetheless, some HCI studies on non-QS users offer some insights particularly relevant to this thesis. Because of their interest in differences in technology use, HCI studies have explored a wider variety of users, in particular new and less enthusiastic users.

For example, Rapp and Cena (2016) provide a valuable study exploring the first-time users of self-tracking whom they refer to as ‘naïve’ users. These users find the self-tracking technologies as requiring too much effort, posing questions about privacy and their data visualisations too abstract. The ‘naïve’ users wanted the tool to provide more explanations and recommendations, and because they were not getting them they found the use lacking rewards. While this study does not provide insight into how these user concerns would be addressed by technology developers, it shows a different way that self-tracking technologies can be perceived as opposed to long-time, enthusiastic users that are usually being studied.

Lazar et al. (2015) looked at engagement and abandonment. They argue that at least half of people who own some kind of activity trackers are not using them anymore.

Participants in their study lost interest in self-tracking technologies as they did not provide

useful information. The information was perceived as suggestion rather than prescription as users were not adhering to it.

Clawson et al. (2015) looked at Craigslist to determine the reasons behind self-tracking device abandonment. They distinguish several kinds of abandonment: happy abandonment – when users switch to a new technology; social switching – when a different device was preferred by someone in family or friends and abandonment when technology no longer fitted with their health needs or was simply found as not useful. The abandonment was most often sparked by the fact that self-tracking technology in use did not meet users.

The findings of these studies suggest that self-tracking data is not universally understandable and useful. Moreover, they point to the agency of users as they pick and choose what data to use and react to, and also decide to stop using the technology altogether. These findings stand in contrast to the idea of ‘datafied power’ found in some of the conceptual works on self-tracking where self-tracking users are seen as controlled by the data they collect (Ruckenstein & Schüll, 2017).

Thus, these HCI studies inspired and informed my research, as I aimed to open up the scope even further and, therefore, focused on another of so far neglected user groups which I referred to as everyday self-trackers. As the studies discussed above show, different user groups use the technologies and react to them differently. By focusing on everyday self-trackers as opposed to other more studied user group – Quantified Self community – I aim to show that self-tracking can be perceived and done differently than what studies on Quantified Self allow to imagine.

2.4 Social science research of self-tracking

Self-tracking has attracted a considerable amount of attention from social sciences. From the three disciplines discussed social sciences has probably the most varied approach. At

the moment, there does not seem to be a predominant approach to and evaluation of self-tracking; however, it is safe to say that QS community plays a pivotal role as an example of self-tracking use and engagement and as a source for ideas about possible self-tracking effect.

In this overview, I group the social sciences works into those that offer insights into self-tracking's role in society, study QS members and lastly those who focus on non-QS self-trackers. As earlier, I make these distinctions to show the diversity of aspects in self-tracking that interest researchers and help me to indicate what insights I gain from different approaches as well as to highlight the difference of the present thesis from the existing works.

2.4.1 SELF-TRACKING IN SOCIETY

Ruckenstein and Schüll's (2017) offer a review of social sciences works on self-tracking. They explore self-tracking through what they refer to as 'datafication' – 'conversion of qualitative aspects of life into quantified data' (Ruckenstein & Schüll, 2017, p. 262).

These authors note that power is a prominent topic in the studies they reviewed. Many researchers explore how data collected by people using wearable technologies is also being stored by the manufacturers of those technologies, sold to third parties or used by insurance companies only to shape users' behaviour in accordance with health norms and ensure the 'neoliberal subjectification' (Ruckenstein & Schüll, 2017, p. 265). Health technologies that allow self-tracking are seen as submitting users to the Foucauldian clinical gaze and expanding the scale of 'surveillance society' (Lupton, 2012, 2016). However, as Ruckenstein and Schüll (2017) note, this kind of view of self-tracking technologies fails to see 'datafied power in all its richness' by avoiding 'cases of noncompliance, appropriation, or existential possibility' (Ruckenstein & Schüll, 2017, p.

265). Changing one's behaviour in accordance to 'normative' recommendations of self-tracking technology is not as straightforward and easy. This is because people are not malleable and docile as some of the scholarship on self-tracking implies. To achieve a richer understanding of datafied power and self-tracking in general, Ruckenstein and Schüll call for 'a loosening of theoretical commitments—a willingness to suspend ready-made analytic frames to explore the wide range of agencies and aims that are in play and at stake' (Ruckenstein & Schüll, 2017, p. 265). Though, this review was published after I finished data collection, I share some of their perceptions of the existing literature on self-tracking and the aim of richer understanding of self-tracking by suspending handy analytical frames and exploring agencies is very close to my research objective.

Self-tracking was often presented as technology-enabled practice that will overhaul the way we approach our health. Philosopher Melanie Swan was one of the first ones to write about self-tracking and her papers often provide basis for the discussion of the subject. Her discussion of self-tracking presents an optimistic picture of self-tracking and its promises. Swan (2012a) argues that self-tracking together with other features of Internet of Things will drive new data literacy behaviours because users will be analysing their data. She sees people, who are almost obsessively engaging in this practice, as pioneers who are 'critical in facilitating the widespread realization of preventive medicine' (Swan, 2012b, p. 111).

While Swan's accounts of self-tracking might be seen as presenting an overly optimistic picture of the 'revolutionary' self-tracking, sociologist Lupton offers a different take on it with a wide-scale analysis and critical approach to self-tracking (Lupton, 2014a, 2013a, 2013b, 2012). Lupton (2012c) looks at moral and ethical implications of health promotion through self-tracking. She highlights the surveillance aspect of self-tracking and argues that mhealth techno blurs the spatial boundaries between public and private surveillance. Lupton problematizes the self-tracking's encouragement of individual self-care: 'This is a

body/self configured as requiring, and in fact desiring, of constant digital surveillance. It conforms to the entrepreneurial, self-regulating subject that is represented as the ideal responsible citizen in neoliberal societies' (2012c, 239). This kind of approach, she states, reduces health problems to the individual level and suppresses the importance of social determinants of health (Lupton, 2012c, 2013a, 2013b). Lupton (2013a) takes up Crawford's (1980) notion of healthism – heightened preoccupation with and moralisation of health – and argues that self-tracking increases it by emphasising on health and its constant monitoring. Lupton (2013d) further argues that in self-tracking practice humans are cyborgs and bodies are represented as machines. Through self-tracking bodies acquire exosenses, and bodily sensations are mediated or even augmented through machines, and users come to know their environment and bodies through the data gathered from self-tracking; hence, this synergy of people and machines can be seen as a cyborg. The body here becomes then exchanges data with other bodies and machines. There is evident trust in numbers over embodied experiences as the former offers something that latter cannot mediate.

Other conceptual works explore and offer ideas through which self-tracking could be analysed. For example, Lupton and Williamson (2017) have written about children as the objects of tracking by a multitude of monitoring devices. They explore children's rights in relation to 'dataveillance', arguing that there is tension between the two and that there are not enough tools to ensure the safeguarding of children's rights.

Lomborg and Frandsen (2015) offered an alternative way of conceptualising and understanding self-tracking. Based on the idea, already found among the social sciences' studies of QS community, that self-tracking can be creative and geared towards more than just collection of numeral data about one's body, they argue that self-tracking is communication. This is because self-tracking it reflects and influences the user 'towards

an audience comprising to the very least the user herself, but often other users of a given service as well' (Lomborg & Frandsen, 2015, p. 2). Lomborg and Frandsen show that self-tracking practices are formed by the user as well as the 'communicative features provided by the technology' (Lomborg & Frandsen, 2015, p. 2). Data visualisations, that self-tracking technologies usually offer is one of those features. They are reflecting and also communicating with the self and can also be seen as a 'communicative ritual' (Lomborg & Frandsen, 2015, p. 8) because it extends the exercise experience and shifts it from bodily to the psychological sphere. More obviously, self-tracking is also a means of communication with others, as technologies often allow to share collected data with others. The exposure of one's physical attainment to others can serve as a motivational mechanism.

Pantzar and Ruckenstein (2014) also highlight the importance of the visualisation of the data in self-tracking. They argue that visualisation of data is critical for making the practice of tracking emotionally compelling. The visualised data from self-tracking technologies have an agentive force as visualised data are critical in creating emotional involvement between people and the data - tele-affectivity. The current self-tracking state reminds the end of 19th century when visualisation of bodily states radically changed how patients and illness are understood.

Continuing the exploration of the relationship between technology, data and self, Walker Rettberg (2014) in her book 'Seeing ourselves through technology' looks into photographs, Twitter and self-tracking technologies as tools of self-representation. With regards to self-tracking, she highlights the seeming objectivity of the technologies and urges to remember that they are not as objective or precise as we perceive them. Here she argues that technologies are part of our audience, as they collect, analyse and adjust our data. Walker Rettberg writes about how the data gathered through self-tracking acts as a

story or narrative of our lives, relating to the studies that show that users have ‘affective ties’ to the data they track (Rooksby et al., 2014; Ruckenstein, 2014).

Jethani and Raydan (2015) extend the argument of the importance of self-tracking and its data on an individual, stating that they influence the persona formation. They argue that self-tracking, though brings new aspects of life in sight, ‘the production of intimate self-knowledge through sensor technology is unlikely to contribute to emancipatory forms of persona-formation’ (Jethani & Raydan, 2015, p. 78).

Crawford et al. (2015) offer a novel perspective on self-tracking as they analyse historical advertisements for weight scales and compare their messages to those of current advertisements for self-tracking technologies. They argue that both weight scale and self-tracking device advertisements speak about self-knowledge and control, promising agency through the collected data. However, self-tracking users are not made aware of the scientific and cultural knowledge that the recommendations that they receive from their devices are based on. Moreover, self-tracking technologies make the collected data available to more than the user – companies that produce these devices and possibly a range of third parties can access the gathered information and form pictures of the user based on the data as well as compare one user to the others, a privilege not available to users themselves. Authors raise this as a problematic side of self-tracking because advertisements promote self-tracking as empowering when in reality the user might be seen as losing more than winning.

In a similar vein, Ruckenstein and Pantzar (2015) analysed articles in the tech magazine *the Wired* and have argued that QS in those articles is a metaphor. The magazine uses the metaphor to highlight certain features of QS and tone down others. Ruckenstein and Pantzar (2015) identify four themes that span through the articles and that are supported

by the metaphor: transparency, optimisation, feedback loop, and biohacking. Each of these themes is interconnected and present people as eager to get data about their body and activities to improve them, and as a consequence to improve their lives.

These works explore self-tracking in broader, structural terms, analysing its potential social impact. They have informed the present my research in that they illustrate how self-tracking is understood and discussed among the social scientists, and thus provide base for thinking about self-tracking. Having this understanding of self-tracking's social role and impact, I can 'zoom-in' into individual use and practice to understand whether the ideas and assumptions presented in these works can be notice at individual level and if so how they play out.

Some researchers are concerned about the changes self-tracking can bring into employment as it is being introduced in some workplaces. Till (2014) drawing on Lupton's work on self-tracking argues that self-tracking tools used for sports through their objectification and quantification of activities allow value to be extracted from the sport, in turn transforming it to labour. People treat certain achievements in sports as objectifications of their labour, embodiment of their abilities. Self-tracking technologies thus rely on this by providing virtual measures of these achievements. Till argues that when this measurement is standardised, corporations that provide the self-tracking tools can cumulate and compare the data, and through this extract value from it by selling it to other companies or providing targeted advertisement. Employers who ask their employees to engage in self-tracking also transform sport into labour and gain profit from the supposed improvements of employee health that require little investment and no efforts of employers. Relying on Lupton's theorisation that self-tracking treats the body as a machine, Till notes that the engagement with exercise data can be seen as 'the harnessing of potential energy, which requires knowledge of the energy expenditure of the individual'

(Till, 2014, p. 454). The latent energy of individual or population is harnessed through a commercial interest in the tracking of sporting bodies.

O'Neill (2016) continues the conceptual exploration of QS at the workplace. While it has been argued that QS can be seen as neo-Taylorism, O'Neill presents a case that shows QS to be closer to what is termed 'European Science of Work'. This group adopted Taylorist methods to work, though it modified them to respond to European physiological studies. O'Neill analyses promotional material of two QS at work technologies and argues that similarly as European Science of Work, these new technologies aim for 'soft domination'. By employing bottom-up surveillance, these technologies aspire to adapt workers' physiological and social rhythms to the arrangement of the working day.

As the new technology that is closely associated with healthcare, self-tracking can be seen as requiring regulation, and some researchers have addressed the legal issues surrounding self-tracking technologies. Daly (2015) looks into implications of self-tracking devices on laws regulating and protecting health information collected by exploring a legal framework for self-tracking information and devices in Australia. She argues that while self-tracking devices collect what can be defined as health information, they do so in a realm that is not yet regulated. Daly finds that Australian laws do regulate some of the information collected through self-tracking devices. However, she notes that these laws are geared only towards companies based in Australia, an issue that may arise in other jurisdictions.

Similarly, Gunnarsdóttir et al. (2015) state that self-tracking technologies are stuck in between fitness, leisure and medical fields, have no clear policy directed to control them, and therefore their safety and accuracy is not ensured. Hence, mhealth technologies for

fitness and wellbeing tracking are establishing ‘a market of self-care, prevention and empowerment’ (2015, p. 4) of questionable medical and care value.

The earlier mentioned practice where employers encourage employees to use self-tracking for health purposes (Lupton, 2014a; Moore, 2015; Till, 2014) has not yet been studied much in practice. Vyas et al. (2015) explored employer-sponsored self-tracking activity, where employees competed in teams to take more steps. The authors found that manually entering steps made participants reflect on their lifestyle and that participants interweaved the competition for more steps with their everyday activities, similarly as participants wanting to reach their tracking goals in the study by Fritz et al. (2014). Participating in this tracking competition affected employee behaviour making them actively try to keep up with the number of steps of the team. Gorm and Schlovski (2016) researched a nationwide workplace step-counting campaign in Denmark. Spending time in the office which participated in the campaign, they found that participants often discussed what counts as a step, questioning the definition and truthfulness of the app's calculations. As employees were competing in teams against each other, the fairness of counting was also an issue. Those, who for whatever reason were not able to participate, often felt excluded from the chats about the step-counting that colleagues had.

The studies that examine the employer-implemented self-tracking experiences offer a way of knowing more about experiences of group self-tracking that is not related to QS. While this population does not adhere to what I refer to as everyday self-trackers, the insights from these studies that do not concern the group experience can be transferred to my study. For example, it would be interesting to investigate whether my participants question the calorie in a similar way that Gorm and Schlovski's (2016) participant questioned step.

Some researchers looked into self-tracking by solely studying its technologies. Lupton (2015) reviewed apps designed to track sexual and reproductive activities and argue that they represent and define sexuality in limited ways that perpetuate stereotypes about men's and women's sexualities. Lupton and Jutel (Jutel & Lupton, 2015; Lupton & Jutel, 2015) reviewed apps designed for self-diagnosis and showed that though app developers claimed authority through medical knowledge and reliance on algorithms, they often failed to prove evidence of their authority and continually reminded users to seek a professional diagnosis. The authors argued that these apps affect patient-doctor relations and diagnosis. Griffin (2012) looks at several food diary apps, including MyFitnessPal. She argues that being eater in modern times requires metis - 'the ability to act quickly, effectively, and prudently within everchanging contexts' (Johnson, 1998 cited in Griffin 2012) to make food decisions, and the food diary apps help in making these decisions. The author states, however, that none of the apps consider pleasures and intensities of eating. Millington (2014) reviewed 10 top health, fitness and nutrition apps (including MyFitnessPal) recommended by Canadian Broadcasting Corporation. The author finds that these apps concentrate on improving health and strengthening online communities. Based on this, he argues that these apps are part of 'mobile privatization' and represent principles of Deleuzian 'societies of control', rationalising a neoliberal attitude to health and fitness. Dow Schüll (2016) has explored the Digital Health Summit of the Consumer Electronics Show and presented the optimistic pictures of self-tracking envisioned by the tech companies. Her work shows how the devices and their presentations by the companies' marketers reframe the meaning of health and individual consumers. Health is no longer something to care for when you are ill; it becomes a daily project. The presentations of such devices as step, activity and sleep tracking wristbands, posture tracking sensors, bottles tracking hydration and forks that encourage you to eat slower show how through

self-tracking one is constantly reminded of possible health and body improvements. The technology is presented as revealing parts of one's lifestyle that without self-tracking remain obscure and possibly threatening wellbeing. For example, Dow Schüll cites Scott Kzicki of Verizon's Health Care Management Markets group as arguing that with the visualisations and ratings of self-tracking data 'You can build a profile or picture of what it is you're doing and this lets you see and understand the choices you're making on a daily basis, which is really who you *are*' (Schüll, 2016, p. 9 original emphasis). Dow Schüll shows that new self-tracking technologies are geared to nudge, rather than support, users towards change in behaviour. Hence, portraying users 'as desiring *not* to be in charge' and the technology 'as a solution to this desire, offering rationality and empowerment precisely where it is lacking' (Schüll, 2016, p. 14 original emphasis).

These studies offer a social science insight of available self-tracking technologies. They are critical about the benefits of the technologies as they unravel the behaviours and values these technologies encourage, and the meanings of the change they promise. This is valuable for my thesis as it helps to form research approach and questions that would help to explore more nuanced aspects and opinions of technology and its use among MyFitnessPal users. However, many of the claims about 'self-governance' and regulation are interesting but have not been explored in practice i.e. do individuals actually subject themselves to these discourses or ideologies or to what extent and how. This thesis aims to address this question empirically.

2.4.2 STUDIES OF QS MEMBERS

Unlike the HCI research on QS members that relied on secondary sources, studies of QS members conducted by social scientist rely on qualitative methods, like ethnography, and provide deeper insights into the community and its members' experiences. Nafus and

Sherman (2014) conducted an ethnography among QSers by attending their meetups and conferences. They found that QSers listened to their bodily cues, rather than completely trusted and followed the information from their self-tracking devices and aimed to combine the two when interpreting data. Moreover, QSers did not necessarily follow the established indicators and norms of health but would form their parameters of health and wellbeing as well as the ways of tracking them. The practices of QSers, though, at first sight, seem to offer a great resource for big data that could be mined and appropriated to understand people's health and another kind of behaviours, actually do not yield to this. This is mainly due to the QSers' individual meanings of health and experiments geared towards their wellbeing rather than the achievement of the norm. Nafus and Sherman (2014, p. 1785) argue that 'such practices constitute an important modality of resistance to dominant modes of living with data' forming up what they termed 'soft resistance'.

Unsatisfied with 'data fetishism' framework that is offered to understand self-tracking, Sharon and Zandbergen (2016) too explored QS community from inside. They showed that QS members 'actively engage with data and render it meaningful in and through self-tracking practices' (2016, p. 3). Instead of finding stereotypical, obsessively quantifying members of QS, Sharon and Zandbergen found heterogeneous group with members exploring different aspects of and having different reasons for self-tracking, which led them to state that QS should be seen as a network of 'quantifying selves' (Sharon & Zandbergen, 2016, p. 5). They argue that it is important to understand how data is given meaning by the QSers. Sharon and Zandbergen found that self-tracking serves not simply as a way of collecting information about self with the aim of improving oneself, but it also acted as a practice of mindfulness, as a means of resistance against and as a narrative and communicative practice for those engage in it. Based on this they state that instead of talking about 'quantified self' we should really be understanding the community as

“quantifying selves” who actively engage with data and render it meaningful in and through self-tracking practices’ (Sharon & Zandbergen, 2016, p. 3). Thus, to speak about the movement in ‘data fetishist’ terms is failing to recognise the creativity and autonomy of QS members and the different ends self-tracking can fulfil.

Similarly, Neff and Nafus (2015) argue against the misconceptions that surround QS community and aim to unwrap the practice of self-tracking. Based on their experiences with QS and self-tracking Neff and Nafus (2015) offer an introduction to both the community and the practice. They provide a background to and implications of self-tracking, discuss the design of self-tracking technologies as well as offer practical guidance on engaging with self-tracking and the data collected through it.

Hence, by deciding to explore QS and understand their practices, instead of taking the existing portrayal of QS for granted, these researchers observed QS, its members and their practices from inside and were able to show the complexity of the community. I am inspired by the approach of these works in my endeavour to open up the realities of self-tracking.

Though I could not observe my participants in their calorie counting endeavours, I asked them about the practices they engage in order to get the number of calories consumed from the calorie counting app. This helped to show what actions and strategies are required for calorie counting. Moreover, participants’ stories about their engagement in self-tracking allowed me to gain insights into the complexity and subjectivity of self-tracking, which highlights that the process of calorie counting, similarly to work in laboratories, is not as straightforward and clear cut as the presentation of self-tracking often allows.

2.4.3 STUDIES OF NON-QS SELF-TRACKERS

Social sciences studies that are closest to the aims of the present thesis are the ones that research users of self-tracking who are not part of any self-tracking community. Both types of studies are still only a few, and thus they provide a so far rare insight into self-tracking from a social science perspective.

As detailed earlier, until recently, most works on self-tracking, especially from social science perspective, were conceptual and often based on media representation of self-tracking. Hence, self-tracking was for some time studied from a distance. I aimed to join the ranks of researchers who want to ‘come closer’ to self-tracking. These are mainly social science works which explored self-tracking through studying its non-QS users and their practices.

Ruckenstein and Pantzar’s (Pantzar & Ruckenstein, 2017; Ruckenstein, 2014) study of daily use of heart monitor offers an investigation of self-tracking that is positioned closer to the users and their practices. They explored how participants perceived and react to the visualisation of the heart rate data collected through the study. By interviewing participants and observing their reactions to the data visualisations Ruckenstein and Pantzar could offer a better understanding of how people engaging in self-tracking relate to their data. They noted how the visualisation changed participants’ perception of their everyday activities and their impact on their heart as visualised data ‘generates new kinds of affective ties between people and their measured actions and reactions’ (Ruckenstein, 2014, p. 77). This kind of insight would hardly be possible when relying on secondary sources and media’s representation of self-tracking. Being in direct contact with self-tracking people and focusing on their practices allowed Ruckenstein and Pantzar to form, a more detailed picture of self-tracking, which is what I aimed with my researched.

Using social practice theory Harries and Rettie (2016) studied everyday walking practices. By focusing on ‘practicalities, materialities and events’ Harries and Rettie hoped to ‘reduce the risk of the research data being distorted by post-hoc rationalisation’ (Harries & Rettie, 2016, p. 4). In my focus on practices I share this aim with them. Similarly to Ruckenstein and Pantzar, Harries and Rettie note how visualisation of data changed participants’ evaluation of their walking practices and made them value accidental walking more. Thus, through visualisation accidental walking was transformed for participants from ‘just something you do’ to ‘a measurable exercise’ (Harries & Rettie, 2016, p. 6). This shows how focus on practices can provide insight not only into the practices themselves but also into their meanings and the impact self-tracking can have in shifting those meanings.

Though they studied experiences of existing users, Pink and Fors (2017), who explored self-tracking from a geography perspective, provide some similar insights. They interviewed people engaging in self-tracking to understand how this practice affects their understanding of space and environment. They found the different ways in which self-tracking affected people’s experience of their everyday environments and practices. Based on their findings, Pink and Fors (2017, p. 11) argue that ‘self-tracking technologies and activities are spatial technologies that render our worlds as meaningful because of the ways in which they configure, and are in turn configured by, relationships between mind, body, technology and environment.’ Authors suggest that self-tracking technologies could help researchers to study tacit knowledge and highlight the importance of non-material in the human-technology interactions. Findings of this study thus point to another dimension of everyday life that self-tracking affects.

Finally, closest to the topic of the present study is research by Niva (2015) who interviewed women using online weight-loss programs based on food journaling. Niva

draws on theories of practice to understand the script of use these programs evoke and the meanings and competences users enact in this use. For women, the food journaling meant liberation from dieting, as they could eat anything they wanted as long as they accounted for it in their diaries. Women also felt like part of the online community, even if they did not actively participate in it. Participants discussed the need to time their journaling, be precise if they wanted to get accurate calorie numbers for food consumed. In addition, they were quantifying their bodies as they regularly logged their body measurements and weight. The graphs and other visualisation offered by the program provided a scientific, material representation of the foods eaten and their bodies, which was rarely questioned. Niva (2015) notes that the competencies engendered by such programs strongly relied on a calculative script, promoting the idea of a rational and self-governing dieter. However, the everyday practices, like eating food prepared by others, which do not easily fit into monitoring and, thus challenge the script. This study helps to better understand how everyday practices are affected by self-tracking. It explores the negotiations required from the user in order to reconcile the different expectations that self-tracking and everyday practices pose.

While direct observations of self-tracking practices would be hardly practical as it would mean following research participants 24/7, I aimed to gather detailed account of self-tracking practices that would enable to understand ‘what self-trackers actually do’. The studies discussed above show that focus on practices not only allows to understand what actions self-tracking requires but also helps to understand the changes in habits and perceptions that self-tracking can lead to. This is close to my research aim, as in my research on calorie counting practices I too wish to address the ways in which data can alter understanding of eating and food.

2.5 Literature's connection to the thesis

In my research of self-tracking I am inspired by Science and Technology Studies (STS) laboratory and technology user studies. They shape my approach to my own research and through this my relation to other studies of self-tracking. There are four main concepts and approaches of STS to science and technology that influence me in the present thesis. These are mainly: diversity of users, 'revolutionary' vs. 'normal' science, opening of 'black-boxes' as well as focusing on practices. In what follows, I outline the ideas of STS that shaped my research, highlight the existing works on self-tracking that relate closest these STS ideas and thus, my research and also explain what use of these ideas can add to study of self-tracking.

2.5.1 EXPLORING TECHNOLOGY USERS: FEMINIST STUDIES OF TECHNOLOGY

In my approach to self-tracking I am inspired by STS works on technology users. In their review of studies on user-technology relations, Oudshoorn and Pinch (2008) distinguish five approaches that contributed to the study of user-technology relations, namely innovation studies, the sociology of technology and in particular the social construction of technology approach (SCOT), feminist studies of technology, semiotic approaches and media and cultural studies approach. Though all of them provide useful insights, I am mostly inspired by ideas of feminist studies of technology, especially the works highlighting the diversity of users.

Feminist studies of technology highlighted the importance of studying and understanding its users. While feminist studies of technology aimed to highlight the neglect of women in accounts of technological development, in the pursuit of their goal they also highlighted and expanded the ideas of users' agency and diversity Oudshoorn and Pinch (2008, p. 546).

Creators of new technology might have imagined several kinds of user groups, who can potentially have different influence on the design of technologies depending on their perception and use of that technology (Oudshoorn, Brouns, & van Oost, 2005). Different user groups have different levels of power to shape the technological development. In order to highlight the diverse levels of power to influence technological development among the users, feminist researchers of technology denoted three main groups of users: end users, lay end users, and implicated actors (Oudshoorn & Pinch, 2003, p. 6). End users are the users to whom the technology is mainly oriented to. Lay end users are those end users who might have been excluded from the expert discourse and who are indirect yet 'effective participants in sociotechnical shaping process' (Ann Rudinow Saetnan, 2000, p. 20). The implicated actors are those who are not at all involved in shaping of technology development but who are affected by the technology.

An important implicated user is the non-user, who can be both voluntary and involuntary non-users (Wyatt, 2003). Wyatt and colleagues (Wyatt, Thomas, & Terranova, 2002, p. 36) identify four types of non-users: resisters, rejectors, the excluded and the expelled. These categories emphasise the difference between kinds of non-use: not everyone who does not use a technology does so for the same reason. Resister did not ever use the technology, rejectors tried and stopped using the technology, the excluded do not use the technology because they cannot access it and the expelled do not use it because they for whatever reason loss their access to it. Hence, some people might voluntarily opt out of certain technology use even if those technologies (like the Internet) are widely perceived as helpful and their use as desirable. This is an important point to be mindful of because as Wyatt notes in her study of Internet use, the non-use of this technology is treated as an outcome of inequality that has to be remedied, which suggests 'the continued dominance of the acceptance of the virtues of technological progress' (Wyatt, 2003, p. 79).

I think that distinction between different kinds of user groups is relevant to self-tracking research. Some self-tracking research already indicates existence of different self-tracking user groups. This is mainly the case in HCI. Few of the HCI studies focused on new users and those who are abandoning self-tracking highlight the variety of users and uses of self-tracking-technology (Clawson et al., 2015, Lazar et al., 2015, Rapp and Cena, 2016).

People in these studies are ‘rejectors’ of self-tracking technology (Wyatt et al., 2002, p. 36) and their use of self-tracking stands in contrast to that of members of QS community, which has so far attracted the most researchers’ attention. However, different user groups not only shape the development of technology in different ways, but also use the technologies differently. By opening the scope of self-tracking user groups that are being studied, these HCI studies provide avenues for different conceptualisation of self-tracking and its implications.

With my research I too aimed to open up the scope of self-tracking by exploring the use of technology in everyday context and extending the range of user groups that are being studied by focusing on everyday self-trackers just like feminist technology studies have done. I am influenced by the feminist technology research in their understanding that users are not a monolithic group and their differences should be recognised and addressed and the HCI studies which acknowledge the importance of these differences for study of self-tracking.

No study so far has explored the non-use of self-tracking and non-use is important from STS perspective. While I did not pursue this avenue directly, I was interested in understanding why users avoid or resist certain features of the MyFitnessPal app that I was studying. In this case, understanding non-use highlights the agency of the users and the way users’ interpretation of technology might be different from that of its developers.

2.6 LABORATORY STUDIES

Coming in the 1970s laboratory studies brought new ways of studying and thinking about science. In my research of self-tracking I am mostly influenced by three aspects that define laboratory studies and distinguish them from earlier approaches to science. These are mainly: first, shift from focus on revolutionary to ‘normal’ science, second, insistence of opening the black boxes of science and acknowledging the messiness that involved in science, and finally shift from study of documents to study of practice.

From ‘revolutionary’ to ‘normal’ science

Some argue that STS could be seen as starting with publication of Kuhn’s *Structure of Scientific Revolutions* in 1962 (Sismondo, 2008). Indeed, Kuhn’s work opened up different perceptions and approaches to science. His ideas of ‘normal science’ and ‘scientific revolution’ can be seen as paving the way for laboratory studies and what they aim to understand. The difference between these two kinds of sciences is shaped largely by what Kuhn referred to as ‘paradigm’ – a group of established ideas, theories and methods that form a coherent scientific tradition (Kuhn, 1996, p. 10). For Kuhn ‘normal science’ first of all ‘means research firmly based upon one or more past scientific achievements’ (Kuhn, 1996, p. 10) and, thus, framed by a paradigm that is prevalent at the time at the specific scientific community. ‘Normal science’ as defined by Kuhn involves theorising and fact gathering ‘with the experiments and observations described in the technical journals’ (Kuhn, 1996, p. 25). To illustrate what he means by normal science Kuhn poses few questions:

On what aspects of nature do scientists ordinarily report? What determines their choice? And, since most scientific observation consumes much time,

equipment, and money, what motivates the scientist to pursue that choice to a conclusion?

‘Scientific revolutions’, on the other hand, introduce new concepts, theories and methods. They shake ‘normal science’ as they initiate a new paradigm that is largely incompatible with the old one and lead to a paradigm shift – gradual replacement or at least subdue of the old paradigm.

The scientific revolutions, like those led by Copernicus or Einstein, for long had been at the centre of science studies. Earlier ‘social scientists have tended through their use of highly specialised concepts to portray science as a world apart’ (Latour & Woolgar, 1979, p. 17). The laboratory studies, on the other hand, shifted the attention to the ‘normal science’. They aimed at exploring ‘normal’ science as making science and scientific practice more understandable and highlighting their mundanity.

The laboratory studies went after the day-to-day affairs: routine tasks, accidental insights, discussions and negotiations that happen in the labs and which eventually lead to findings and publications. This can of course in some cases lead ‘scientific revolutions’. However, most often laboratory life, as Latour and Woolgar (Latour & Woolgar, 1979, p. 31) noted, constitutes of “‘normal” science which is relatively free from obvious sociological events’. Thus, their account of ‘laboratory life’ includes description of arrival of mail, the tasks of the cleaner, descriptions of the settings with such details as items on a scientist’s desk. By observing the mundane, Latour and Woolgar (1979) were able to provide an account of social construction of scientific facts. They showed that ‘normal science’ is influenced by social factors which can determine the direction of scientific investigation and decide what entities will be perceived as scientific facts.

With this in mind, I see similarities between earlier studies of science and recent studies of self-tracking, especially those exploring self-tracking's role in society. These have influenced and informed the present thesis, and I rely on them when drawing a wider background for my study. They illustrate how self-tracking is understood and discussed among the social scientists. Most of the works discussed indicate the tendency to think of self-tracking in wider terms: how it affects healthcare, the self, privacy or workplace. However, this often can be seen as exploring the 'revolutionary' self-tracking that will bring big changes in the aforementioned areas - as it is in the case of Swan and Lupton's works.

Similarly to accounts of science studies that focus solely on 'revolutionary science', the approaches of both Swan and Lupton neglect the other kinds of users and uses of self-tracking, and, therefore, present a limited picture of self-tracking. These and other works exploring self-tracking's role in society explore it in wider terms and are helpful for thinking about possible policies. However, they often exaggerate hopes and fears and, thus, do not cover the 'normal' self-tracking: what self-tracking entails in everyday contexts and how whether it has an effect on them. Inspired by the move from studies of 'revolutionary' to 'normal' science, I want to offer a contrast to both Swan's and Lupton's views of self-tracking by exploring the 'normal', even mundane self-tracking. Thus, in my research I want to focus on what I refer to as 'everyday self-trackers'. I want to explore the motivations and approach to self-tracking technology and its use of the 'everyday self-trackers' in order to understand the what 'normal' self-tracking is.

Opening 'black-boxes'

Scientific research and findings are influenced not only by scientific processes and data, but also by everyday factors, such as bureaucracy, pressure to publish, personal as well as

scientific rows. However, the scientific ‘craft practices’ (Latour & Woolgar, 1979, p. 29) and the way they are organised to become tight facts that are found in scientific publications usually remain unknown by those outside the laboratories. The scientific facts are ‘black-boxed’ – the efforts and work that was required to produce them are hidden from the view and the scientific facts seem to be standalone. The dependency of successful definition of scientific facts on often non-scientific context and circumstances as well as the potential messiness of the scientific work remain invisible in the well-structured scientific facts.

The laboratory studies aimed to change this. By entering the laboratories and observing scientists at work, social scientists were able to provide the ‘thick description’ of how scientific facts are constructed. For example, Knorr-Cetina argues that looking at the laboratories can help us to see how scientific products are structured by the selections through which they are generated – ‘the circumstances of production are integral part of the product’ (Knorr-Cetina, 1983, p. 124). In similar vein, in his study of laboratory talk, Lynch states that ‘successful experimentation would be impossible without [...] decisions to proceed in ways not defined a priori by canons of proper experimental procedure’ (Lynch, 2017, p. xiv). Laboratory studies offer an insight into ‘the realities of scientific practice’ (Latour & Woolgar, 1979, p. 29) that help to open the ‘black boxes’ of scientific facts.

I think that opening of ‘black-boxes’ in the context of self-tracking can be as useful as it was for laboratory studies. The laboratory studies’, at the time, revolutionary ideas about science invite conceptualisation of self-tracking as a messier, complex practice. I see the works into Quantified Self (QS) community by Sharon and Zandbergen (2016) and Nafus and Sherman (2014) utilising this conceptualisation by extending it to QS. Both studies aimed to in some ways to open the ‘black box’ of QS community as for some time it was

presented as quite ‘geeky’, technology driven group that is full of people who are obsessed with improving themselves. By conducting ethnographies among QS groups these scientists were able to show what really the motivations and attitudes of QS members are and by doing so dispel some myths about this group.

This is the avenue I aimed to follow in my exploration of ‘doing calories’ – I wanted to open the ‘black box’ of self-tracking to see what is required from the people who are counting calories to be able to translate the food consumed into calories. Though I could not observe my participants in their calorie counting endeavours, I asked them about the practices they engage in order to get the number of calories consumed from the calorie counting app. This helped to show what actions and strategies are required for calorie counting. Moreover, participants’ stories about their engagement in self-tracking allowed me to gain insights into the complexity and subjectivity of self-tracking, which highlights that the process of calorie counting, similarly to work in laboratories, is not as straightforward and clear cut as the ‘black box’ presentation of self-tracking allows.

Moreover, the idea of opening of ‘black-boxes’ can offer a different way of thinking about the data collected during self-tracking. Just as scientific facts, though generally perceived as ‘objective’ (Sharon, 2016), self-tracking data can be contingent on social factors and influences. This is another avenue that I aimed to follow in my exploration of ‘doing calories’ – I wanted to open the ‘black box’ of self-tracking to see what is required from the people who are counting calories to be able to translate the consumed food into calories.

From documents to practices

Before the advent of STS, traditional philosophy of science was criticised for its focus on scientific products which lead to disregard of scientific processes (Soler, Zwart, Israel-

Jost, & Lynch, 2014, p. 21). Sociology of science, at least at its inception by Robert K. Merton, focused on the functionalist approach to science, which aims to explore the historical development of science as a system in relation to the wider social structures. An example of this is Merton's exploration of the relation between protestant ethics and the motivations for new scientific developments (Merton, 1973). Merton analyses and presents the functions that Puritanism and science had played in society, one of which was the support and fortification of each other. As science has grown to become dominant social value and importance of religion has faded, this function no longer exists. Quite the opposite, now science and religion are functioning separately. Concern with science's position in and relation to society means that this and other similar social studies of science of the time can be characterised by their use of historical documents and accounts. Science here is studied from a distance – whether physical or chronological. STS slowly shifted this viewpoint – its interest in practice required closer engagement with scientists. Right from the beginning STS had a focus on processes and practices in science. This can be traced back to 1970s to the 'Strong programme' and 'Bath school' in the UK and ethnomethodologists in the US (Soler et al., 2014). This was soon followed by laboratory studies, first by Latour and Woolgar (1979), and later by Knorr-Cetina (Knorr-Cetina, 1981) and others. STS with laboratory studies brought the new approach to science studies – becoming 'concerned with "what scientists actually do"' (Soler et al., 2014, p. 3). The focus on scientific practices in laboratory studies required to move away from 'retrospective reconstructions of actions and results provided by scientists and traditional philosophy of science' (Soler et al., 2014, p. 12). Instead, the 'methodological ideal' is to 'recover important aspects of actual scientific activity that are left out of scientific publications and, more generally, that tend to be "forgotten" after controversies are settled and facts are established' (Soler et al., 2014, p. 13).

Thus, in order to ‘penetrate the mystique of science and to provide a reflexive understanding of the detailed activities of working scientists’ authors of one of the first laboratory studies - Latour and Woolgar - based their study ‘on the experiences of close daily contact with laboratory scientists’ (Latour & Woolgar, 1979, p. 18). This approach meant stepping back from scientists’ accounts of how they achieved certain findings, and instead adopting anthropological methods, especially ethnography and participant observation. Thus, Latour and Woolgar even called their project ‘anthropology of science’ (Latour & Woolgar, 1979, p. 27).

Similarly, in her exploration of a plant protein research lab, Knorr-Cetina noted that in order to successfully study science the researcher cannot depend on accounts of others and needs to expose oneself to ‘the savage meaning of the scientists’ laboratory action’ (Knorr-Cetina, 1981, p. 23). Knorr-Cetina adopted what she termed ‘sensitive methodology’ (Knorr-Cetina, 1981, p. 17) that requires ‘direct, unmediated and prolonged confrontation of the situation under study’ as well as ‘methodological interactionism’ which meant that her ethnography needed to focus on practices rather than cognition of scientists.

Observing the activities scientist engage in when they do scientific work was quite a ground-breaking approach to study of science. Especially, when for years analysing historical and biographical accounts was considered as a main way of studying science. In my research of self-tracking I am inspired by this move from historical and second-hand accounts to study of practice. In particular, I wanted to apply this to study of self-tracking. Until recently, most works on self-tracking were conceptual and/or based on exploration of media representation of self-tracking or videos of Quantified Self meetups. Hence, self-tracking was for some time studied from a similar distance that science was. I aimed to

join the ranks of researchers who want to ‘come closer’ to self-tracking. These are mainly social sciences works that studied non-QS self-trackers like Harries and Rettie (2016), Pink and Fors (2017) and others discussed earlier, who study self-tracking by focusing on practices.

While direct observations of self-tracking practices would be hardly practical as it would mean following research participants 24/7, I aimed to gather detailed account of self-tracking practices that would enable to understand ‘what self-trackers actually do’. The studies discussed earlier, show that focus on practices not only allows to understand what actions self-tracking requires but also helps to understand the changes in habits and opinions that self-tracking may engender and how. This is close to my research aim, as in my research on calorie counting practices I too wish to address the ways in which data can alter understanding of eating and how does this happen .

2.7 Concluding thoughts

A combination of the ideas and works discussed above has shaped my thinking about and approach to self-tracking. First, following feminist technology researchers’ ideas about different user groups and HCI works on new and less motivated users of self-tracking, I wanted to differentiate between diverse self-tracking user groups and acknowledge their different kinds of engagement with self-tracking technologies. In particular, I focused on everyday self-trackers – users that are not part of Quantified Self community and who tend to self-track alone. I acknowledge that everyday self-trackers can probably be divided into even smaller groups of users, but for this thesis my aim was to first emphasise the existence of other kinds of users than Quantified Self community members and to broadly define and understand their use.

Then, inspired by laboratory studies' move from 'revolutionary' to 'normal science', I aimed to offer a different perspective than that offered by more conceptual works focusing on 'revolutionary' self-tracking (Lupton, 2013; Swan, 2012). In my attempt to move away from 'revolutionary' self-tracking, I explored the 'normal' self-tracking and its mundane aspects to gather a richer, more comprehensive understanding of self-tracking.

Similarly to STS researchers engaging in laboratory studies who tried to open the 'black box' of science, studies by Sharon and Zandbergen (2016) and Nafus and Sherman (2014) aimed to open the 'black box' of QS. Motivated by these works and their insights, I aimed to explore the messiness of self-tracking use and to understand the negotiations required for successful transformation of food into calories.

Lastly, my focus is on activities and practices that use of self-tracking technologies involves, which stems from STS laboratory studies as well as self-tracking research which explored self-tracking users and focused on their practices (Harries & Rettie, 2016; Pantzar & Ruckenstein, 2017). These studies highlight that that by studying practices of self-tracking we can not only explore what activities self-tracking involves, but also see how self-tracking shapes and affects them.

Thus, through the lens of STS and some of the insights of self-tracking literature, I am focusing on diversity of users, mundanity, opening of the 'black-box' and as well as practices of self-tracking. I think it is important to explore what people engaging in self-tracking actually do when they self-track and how they perceive self-tracking. As by exploring actions and practices of self-tracking users we willy-nilly broaden the existing picture of self-tracking and allow potential agencies to unravel (or show the lack of them). By focusing on the outlined ideas, I am to contribute to the group of the ethnographic

studies of self-tracking that offer ‘a richer sense of [datafication’s] agentic possibilities’
(Ruckenstein & Schüll, 2017, p. 268).

CHAPTER 3

WHY DO CALORIE COUNTING APPS MAKE SENSE? TRACING THE DEVELOPMENTS OF THOUGHT AROUND NUTRITION AND WEIGHT

3.1 Introduction

MyFitnessPal is one of the many technologies of self-tracking, which include wristband pedometers, sleep trackers telling users about their REM sleep, fertility trackers and many more. Boasting 75 million users (MyFitnessPal, 2014), MyFitnessPal seems to be considered a useful tool by many. However, why does MyFitnessPal along with many other similar apps and technologies that promote calorie counting make sense to us? Why the number of pounds or kilograms our body weights is important to us? And similarly, why does calorie counting seem relevant to achieving our weight ideals? In this chapter, I examine the historical development of objects that are directly linked to weight and nutrition and can be seen as enabling technologies like MyFitnessPal to exist as a meaningful and useful self-regulation tool. MyFitnessPal quantifies the body through evaluating it as a ratio between height and weight and then helps its users to quantify their nutrition by observing calorie values of food. Hence, to understand why using MyFitnessPal seems like a meaningful way to control weight, I will explore the train of thought behind the two quantifications – quantification of body and quantification of food. In particular, I will look at quantification of the body by studying body mass index (BMI) and height and weight tables, and quantification of food will be addressed by detailing the history of calorie.

Quantification is not the only feature that connects calories, BMI and height and weight tables. Another thread that links them is the fact that all of them were initially developed for scientific or industry use, but eventually became accepted and used by the masses. This has been particularly prominent with regards to calories, where conscious efforts were put into spreading the idea of calories from the labs to the kitchens.

The spread of these three entities outside the labs and offices they were developed in indicates that society was accepting the premises they were based on. Therefore, before delving into the development of calories, BMI and height and weight tables, I will describe the social context and the thoughts around the quantification during 19th and the beginning of 20th century, when calories, BMI and height and weight tables were developed.

3.2 Quantification and its social meaning

The calorie, macronutrient, BMI and height and weight tables are quantifications. Thus, to understand their development, it is important to set them the context that enabled ideas and tools that are based on quantification to emerge and flourish. I note that the ideas about governing, efficiency and management of the body were guiding (and were being guided by) quantification and made it more prominent, in nutrition and body regulation among other spheres. Moreover, the rationalisation that science offers to a negative evaluation of fatness continues the moral evaluations of fatness that were previously offered by Christianity.

The beginning of quantification might be traced to the Enlightenment that spurs the rationalism and increased empiricism in science as well as growing acceptance of science as a source of knowledge and reason. Rationalism and empiricism bring anthropometry – the scientific study of the measurement and proportions of the human body. Measurement

of skulls, noses, heights and other body parts provide a new, objective way of knowing humans, impelling phrenology, craniometry and similar movements akin to define person's character and capacities through/by physical traits. The early interest in body weight and nutrition can be seen as connected to these ideas. Thus, as Biltekoff (2013, p. 7) notes: “modern dietary reform” was born not only because science made it possible to define a “good diet” in empirical terms, but also because the cultural context meant that such a definition was taken as a neutral and authoritative kind of truth’.

The growth of quantification was tightly related to governing, both state and business-wise (Porter, 1995). Building on Foucault's work on genealogy and archaeology of human sciences as well as on his ideas of power and knowledge Miller and O'Leary (1987) provide an analysis of accounting since the beginning of 20th century. They show how wastage and efficiency are emphasised through accounting, which in turn influences other calculative techniques that regulate individuals at work in the 20th century. The norms and standards become adopted in the workplace and function as regulatory mechanisms to ensure the highest efficiency and lowest wastage. Miller and O'Leary locate the emergence of standard costing and budgeting in a wider shift towards administration of social life that was driven by comparisons of capacities of individuals against standards set out by sociology and psychology. The drive for efficiency was marked by proposals of ‘various projects for improving the life of the person and, thereby, of the nation’ (P. Miller & O'Leary, 1987, p. 261). The authors see this as a way of building a certain kind of person who is, if not ideal, then governable to be close to the ideal/norm.

These ideas of standards as ensuring highest efficiency and lowest wastage applies to the development of nutritional science in the 19th century. The science that supports ‘the regulation of our dietary intake, with the accompanying stigma that it attaches to fat’ was not introduced to reduce the weight of higher classes, but ‘when medical officers

appointed by the British government sought to eliminate the problem of malnutrition and the diseases it fostered among the poor of England [and other Western European countries]’ (Huff, 2005, p. 31). The interdependence between state and its citizens meant that citizens should be healthy to work, and state needed to help them to achieve this. So the scientific focus on nutrition in the 19th century can be linked to the ideas about diet’s influence on labourer’s health and efforts to formulate the adequate diet (Kamminga & Cunningham, 1995, p. 2). Because of this interdependence, health and, therefore, nutrition were not important on their own, but as factors affecting the efficiency of labour. The hope of improving lives and labour of the workers can be seen as the utilitarian goal ‘to maximise pleasure and minimise pain’ and rationality of numbers and statistics could help to ‘calculate precisely what factors were necessary to the maintenance of a harmonious society and to develop a system for managing these factors in order to alleviate the majority of human suffering’ (Huff, 2005, p. 32). Hence, as Kamminga and Cunningham (1995, p. 5) argue ‘concern with work, in relation to physical efficiency, remained central to much of nineteenth-century nutritional science, and could be readily adopted by the state to promote its interest in having a strong army and navy and a productive labour force.’

Thus, the governability and necessity to be close to the norm can be applied to body weight and nutrition. For the nutritional reformers of the 19th century, the workings of the body were ‘continuous with other forms of labor within the overall economic system of the nation’ (Huff, 2005, p. 32). The body they addressed, therefore, is a labouring body that could be evaluated in terms of its efficient use of resources. This impelled the use of economic terms in the discussion of bodily processes related to consumption of food and stigmatisation of fat as ‘a parasite, rather than a worker, in the corporeal economy’ (Huff, 2005, p. 41). Though these standards were developed for utilitarian public health, they

were adopted for the management of middle-class bodies and thus ‘the efficient body achieved hegemony, leaving little room for positive resignifications of the corpulent body’ and popularising the elimination of body fat (Huff, 2005, p. 47).

Schwartz (1986) writing about 19th century US, argues fatness was associated with volume rather than measurable weight. At the end of 19th century, adiposity was qualitatively determined, and scales were rare to find in the doctor’s office; however, when scales became more easily available at the beginning of 20th century, weight acquires a meaning, fatness became quantified (Jutel, 2009) and simple observation of volume becomes deceptive (Schwartz, 1986, p. 172). Hence, science’s preference for empirical measurement and growing availability of tools that enable it as well as the social perception of measurement and numbers as providing an objective truth about life drove the quantification of fat, weight and nutrition.

The quantification of fatness and food, though seemingly objective (numbers cannot lie or imply), is not without moral implications. Quantification is not a neutral scientific endeavour, as it provides a particular way of perceiving and explaining the world (Porter, 1986, 1995). Referring to the US, Rosenberg (1997) states that throughout the 19th-century science and religion were perceived as offering similar values. Science was harnessed to ensure the protection and spread of these values, and this applies to the moral understanding of food and fat. Coveney (2006) drawing on Merton’s work, states that science, if not influenced by ascetic Protestantism, where God is found in nature, and the connection between nature and people can be known only through rational and empirical means, then shares the same system of thought. Protestantism spread its influence on educational systems in Germany, which was a leader in early nutrition research, thus influencing the approach adopted to study nutrition. Equally, science adds to the previously prevalent religious ideas about food and eating: ‘By grounding food in rational

and biomedical discourses, nutrition redefined ‘goodness’ for a modern subject for whom food had already been problematized by ascetic Christian beliefs and practices’ (Coveney, 2006, p. 89). Thus, the moral judgements about food prevail today as well as they did in earlier ages, except today’s judgements are rationalised through basing them on scientific findings by nutrition science (Conveney 2006; Biltekoff 2013). Same pertains to perceptions of fat and obesity. For example, Gilman (2010, p. 51) argues that ‘[w]ith the Enlightenment, obesity became one of the diseases that modern medicine had to confront’ – middle-classes, who had access to abundant food, were keen to see obesity as a health rather than moral issue. The religious perception of obesity as a mark of the unhealthy body is continued through physiological and psychological explanations.

3.3 Quantifying nutrition and food – calories

3.3.1 BODY AS A CALORIE DRIVEN MACHINE

Scientists long had ideas about how food interacts with the body. However, it is only since the chemical revolution in France in the late 18th century ‘that old and new ideas began to be tested in a quantitative, scientific way’ (Carpenter, 2003a, p. 638). In the early 19th century scientists were mainly interested in digestion and how different foods were broken down (Huff, 2005, p. 34) and only around mid-century focus shifted to nutrients and ‘the investigation of physiological chemistry, or chemical physiology became a reasonably systematic scientific endeavour’ (Kamminga and Cunningham 1995, 2).

The finding of William Prout in 1827 that human food consists of three classes of component ‘the saccharine, the oily, and the albuminous’ (Kamminga & Cunningham, 1995, p. 2) were confirmed in 1840 and called carbohydrates, fats and proteins. Justus Liebig studying inorganic chemistry found that nutrient substances of plants were

inorganic, which helped him to develop artificial fertilisers that assured greater productivity of food benefiting the society and the state (Kamminga & Cunningham, 1995).

Building on this idea of efficiency and improved productivity Liebig studied animal and human chemistry and nutrition which he saw as 'phenomenon simply of chemical changes - which can be assessed by calculation of inputs to outputs' (Kamminga & Cunningham, 1995, p. 5). This perception of the human body as an engine that converts energy from food to physical energy in labour was common among 19th-century nutritional scientists in their aim to study human efficiency (Milles, 1995).

Karl Voit along with 'other physiologists and chemists sought quantitative scientific methods to facilitate socio-political decision making in the belief that it was thus possible to solve the potentially explosive "social question"'. (Milles, 1995, p. 78). Voit contributed to this end by studying along with Pettenkofer metabolism of fasting man in respiration calorimeter (Schwartz, 1986, p. 135). It was essentially a room in which 'food taken into the body was transformed through digestion into a set of discrete metabolites that could be extrapolated through the human output of gas' (Mudry 2009, p.32). This provided estimation of standard metabolic rates and caloric demands of some physical activities (Schwartz 1986) and helped Voit to establish dietary norms – 'Voit Standard' – the number of grams of carbohydrates, fats and protein, as well as number of calories that an adult weighing 70kg and performing average physical work requires (Milles, 1995, p. 78). This became scientific standards used until the end of the 19th century.

Nutritional science further aimed to analyse foods by their constituent parts, how much energy they gave to the eater and how much energy different eaters require. German scientist, Voit's student Max Rubner achieved the first two aims with the help of a bomb

calorimeter. Using a bomb calorimeter Rubner measured the heats of combustion of many different proteins, fats, and carbohydrates found in individual foods and determined energy density of each, showing that 1 gram of fat equals to 9 kcal, while 1 gram of carbohydrates and proteins both equal to 4 kcal (Buchholz & Schoeller, 2004). Based on this finding, Rubner developed his Isodynamic Law ‘that the food-stuffs may under given conditions replace each other in accordance with their heat-producing value’ (Rubner cited in Chambers, 1952, p. 4). The newly introduced concept of energy conservation in a different form and establishment of the mechanical equivalent of heat by Joule (Carpenter, 2003b, p. 642), was shown by Rubner to apply to living animal bodies as well because the food material oxidation was equal to the heat loss from the body (Chambers, 1952, p. 5). This law is more commonly known as ‘a calorie is a calorie’ truism. Rubner saw diet as a way of protecting workers from adverse consequences of overworking. Therefore, he wanted to build knowledge about ‘quantities and types of nutrients which would improve the nutritional condition and thus make an increase in productivity possible, both at an occupation-specific level as well as for the nation as a whole’ (Milles, 1995, pp. 83–84). Rubner wanted to correct false ideas about values of meals held by the wider population, to prevent wasting of money among poorer classes and improve knowledge of housewives (Milles, 1995, p. 84).

The following endeavours were not German-specific and were shared by Wilburn O. Atwater – the American ‘father of nutritional science’. While working in Germany in Voit’s laboratory along Rubner, Atwater experimented with the respiration calorimeter. Inspired by this experience Atwater and his colleagues constructed similar room calorimeter allowing to measure caloric energy requirements. To gather this information, participants were required to perform different tasks, including manual and mental work (Biltekoff, 2013). The room calorimeter gave very precise results, reacting to the slightest

changes in temperature (Mudry, 2009). Together with chemical analyses of food, this provided an empirically informed knowledge about how much energy people, undertaking different tasks require, and which foods could best meet their needs. ‘The calorimeter was a cornerstone technology for the application of science to human food’ – states Mudry (2009, p. 33). By turning food and physical activity into calories, calorimeter facilitated in making communication about food more numeric.

Remarkably, despite being an essential basis for nutritional science since its early days, as well as shaping our understanding of food today, as exemplified by MyFitnessPal calorie counter, ‘calories do not actually exist as constituents of food’ (Scrinis, 2013, p. 116).

First and foremost, a calorie is a unit of energy measurement in physics. A calorie is the amount of energy required to raise one gram of water by 1°C (Hargrove, 2007) but the calorie we refer to in food labelling and popular discourse is really a kilocalorie equivalent to 1000 calories (Buchholz & Schoeller, 2004). A calorie is not on The International System of Units (SI) as a unit of measurement, and in physics and chemistry, joule rather than calorie is used to measure energy (Hargrove, 2007). Thus the use of calorie in nutrition seems to be a relic from the 19th century, as Atwater chose it and popularised it as a unit for evaluating the food in his articles in popular middle-class *Century* magazine and USDA Farmers’ Bulletins (Biltekoff, 2013; Hargrove, 2006). Though it was calorie that introduced ‘a new ontological status for food’ (Mudry, 2009, p. 44) adding to (if not surpassing) the taste, the smell and other embodied senses, Joule would have played the same role if Atwater had chosen it as a unit of measurement. Whether or not a calorie is the most proper unit of measurement for the energy of food and human activity might not be too significant. What is important is that the scientific perception of food and human activity required such a tool.

The calorie as a valuation of the food only makes sense in relation to the body: '[t]here are no molecules of calories in a piece of chocolate cake; instead those calories, as measures of energy, only come into being through burning that cake' (Guntham in Biltekoff, Mudry, Kimura, Landecker, & Guthman, 2014, p. 24). And while we are accustomed to talking about physical exercise as 'calorie burning', the scientific calorie refers to flame kind of burning, and it is not clear whether our body 'burns' calories in the same way as flame would (ibid.). Quantifying food through calories implies a mechanic understanding of the body, where body works as an engine producing as much energy as it is fuelled with. Precisely this understanding of body as a machine, or better yet as an engine, embedded in Voit's theory of food metabolism that Atwater imported from Germany, allowed for quantification of food and human activity using calories (Mudry, 2009, p. 32). Today, this perception of the body as a machine and quantification of nutrition enables such technologies as MyFitnessPal. The app relies on this mechanistic understanding of the body in the way it works: in order to lose weight user needs to burn body fat, which can only be done by burning more calories than being consumed. The equation at the bottom of the screen always reminds users about this mechanistic idea as displays the suggested calorie limit with eaten calories subtracted, extra calories available for consumption added if extra physical activity is logged and the calories left for consumption after the equal sign.

The calories-in equals calories-out equation that nutrition relies for quantification of the food and energy 'may be accurate as a way of measuring food and the body at the abstract level of pure energy or heat transfers, but it tells us little about how the body metabolizes different food substances' (Scrini, 2013, p. 222). Moreover, because of its roots in physics, this mechanical law when applied to human bodies treats them as identical and misses out on variation that exists among humans – from age and ethnicity to class and

culture (Gard & Wright, 2005), therefore failing to make sense of differences in metabolism. Despite its shortcomings, the body-as-a-machine model was successfully appropriated and is still used by medical professionals. In their analysis of *Cecil* medical textbooks published since 1927, Chang and Christakis (2002) show that obesity is depicted as essentially resulting from a caloric intake higher than the output – an account based on the mechanical model of energy consumption. The authors note that superimposed explanation of the causes of the caloric imbalance changes through the year: from blaming the overeating individual to challenging the society both for causing obesity and stigmatising it (Chang & Christakis, 2002). The analysis of dieticians textbooks reveals same adherence to the mechanistic model of the body throughout most of the 20th century until the 1990s when gradual acceptance that dieting as means of losing weight fails emerged (Parham, 1999). Though these authors note the change in the medical thinking about weight gain, the negative attitudes of medical professionals towards the ‘overweight’ when they are encouraged to eat less and move more implies that mechanistic understanding of body prevails.

3.3.2 DOMESTICATION OF CALORIES

Atwater is an important figure in nutritional science not only for his findings, some of which, namely the ‘Atwater’s factors/system’ – extension of Rubner’s work on metabolised energy value of fat, protein and carbohydrates – are still used in nutrition science (Buchholz & Schoeller, 2004), but also because of his collaboration with the US government in spreading the nutritional knowledge. United States Department of Agriculture (USDA) published final results in the form of tables showing calories and nutrients per serving of food, which were quickly adopted by the middle-class (Biltekoff 2013). Therefore, the value of food acquired new measurement.

According to Schwartz (1986) through their numerical content, the food calorie and nutrient tables were supposed to dispel the illusion of unlimited prosperity that Americans might hold and induce economisation. All this knowledge gathering was intended to draw the connection between the nutritional value of food and its costs to teach the poor to choose more nutritionally valuable food cheaper (Coveney, 2006). Atwater argued that the more expensive, more flavourful food was not necessarily the most nutritious, and he taught working classes to buy cheaper cuts of meats, cheaper fish and other produce that gave the same or more amounts of calories for a smaller price (Schwartz, 1986). The consequence of Atwater's pursuit for improved eating and spending habits among the poor was the emergence of domestic science, development of which is presented by Biltekoff (2013). Apple argues that through domestic science women, as the main caretakers of the family were both influenced and had an influence on nutrition research (Apple, 1995). Domestic science offered women an entrance point to the previously forbidden arena of science. A leading figure in domestic science Ellen Richards suggested the term *euthenics*. Related to Galton's eugenics, *euthenics* refers to the science of better living that could improve the individuals and race at present (Biltekoff, 2013). Nutrition science takes a central position in the endeavour of *euthenics*. To acquire better knowledge about the eating habits of families, domestic scientists supervised by Atwater conducted dietary surveys. They weighted the food in the home, then for a week they were present during mealtime to notice any waste, and after a week measured all the remaining food, calculating the amount of food, calories and the nutrients that were consumed (Biltekoff, 2013; Coveney, 2006). Domestic science, thus keenly adopted nutritional standards based on calories and nutrients, and brought them to the kitchen. Cooking had to rise from the messiness of tradition and casualness to order of rationality and calculations (Biltekoff 2013). Calorie, therefore, played an important part in making this happen, as it provided

the means to rationalise food choices and control the consumption. Hence, calorie quantified food and changed its value not only for the scientists interested in metabolism but also for women trying to cook, what government has suggested as a nourishing meal for their families.

MyFitnessPal is the result/extension of this domestication. As mentioned earlier, MyFitnessPal adopts the mechanistic understanding of the body and calorie regulation that relies on it that (at least) was prevalent among nutrition scientists. However, the tool is not intended to be used only by these scientists, but by *everyone* who wants to regulate their weight. The ideas that guide the weight loss in MyFitnessPal are simple to grasp, yet they are still based on science and objective numbers, which reassure users of the legitimacy of calorie-counting-based weight loss approach.

3.4 Quantifying the body – BMI and Height and Weight Index

3.4.1 THE STRIVE FOR THE (UNATTAINABLE) IDEAL – BMI

Another quantification tool that, despite being repeatedly criticised, is still used by medical professionals is Body Mass Index (BMI). Individual BMI is calculated by dividing the weight by the square of height in meters. The inventor of BMI was 19th-century Belgian astronomer and statistician Quetelet, who aimed to apply probabilities and mathematical analysis to the human body (Eknoyan, 2008). Quetelet believed that science, especially mathematics, could rationalise and order social disorder, and borrowed Comte's term *social physics* for this new science (Porter, 1986). Quetelet wanted to use the Gaussian distribution, which he termed 'normal', in order to define the 'average man' – the one whose measurements are at the centre of the curve. The 'average man' would be the average of all human attributes in a given country, could be treated as the 'type' of the

nation, the representative of a society in social science comparable to the centre of gravity in physics' (Porter, 1986, p. 52). He demonstrated that, when relying on data from large-scale population studies, measurements of physical attributes of human bodies distributed themselves in the Gaussian bell-shaped curve (Eknoyan 2008). This study could be linked to the earlier mentioned anthropometry trend of the 19th century to which Quetelet contributed through finding Gaussian distribution in social phenomena, human behaviour or character (Eknoyan, 2008; Jutel, 2001). For example, he studied the relationship between births, deaths and time of the year (Porter, 1986). The physical qualities of the 'average man' could be calculated fairly simply; however, the moral qualities posed a problem. While trying to define the physical attributes of the 'average man', Quetelet collected weight, heights and chest girths of Scottish and French army conscripts and plotted them along distribution. By doing that he noticed that each height had a normal distribution of a range of weights, and further exploring these numbers he observed that the weight of conscripts closest to the middle of the distribution (i.e. 'normal') was proportional to their height squared (Oliver 2006). This observation was the invention of Quetelet Index. Following his wish to describe the 'normal man', Quetelet argued that this neat proportionality of weight and squared heights implies what 'ideal' weight for each height should be (Oliver 2006).

In the 20th century, Quetelet Index gained prominence when its validity was confirmed by Framingham Heart Study (Eknoyan, 2008) and was later renamed to BMI by Ancel Keys, who after employing it in his famous Seven Countries Study, promoted BMI as the best existing indicator of relative weight (Fletcher, 2014). Gradually it was adopted by obesity researchers in both the US and UK, and by the mid-1990s it 'had become the standard method of both measuring and defining obesity' (Fletcher, 2014, p. 344). In the times of increased attention and quantification of obesity, BMI's links to Enlightenment science

and its revival in modern research made it highly regarded (Fletcher, 2014). The cut-off points for underweight, overweight and obese were already developed before BMI was adopted as the best tool for obesity research; however, the cut-off points have been varying since. For example, in the US cut-off points for overweight, defined by the official annual report *Health United States*, were 27.8 for men and ≥ 27.3 for women from 1985 to 1998, while in other governmental publications it was ≥ 25.0 for both sexes, and remains so still (Kuczmarski & Flegal, 2000; Oliver, 2006). Halse (2009, p. 46) argues that ‘the idea of an obesity epidemic [was made possible by the] development of a discourse of a normative Body Mass Index’. BMI as a numerical measure was easy to understand and work with, so the prevalence rates of overweight and obesity were easily constructed and represented on the infamous PowerPoint slides showing the gradual increase of obesity in the different states of the US (Biltekoff, 2013; Fletcher, 2014; Oliver, 2006). Thus, with the help of BMI obesity can be seen spreading like the flu.

Today BMI a tool that indicates individual’s health in relation to their weight. It is used by medical professionals to indicate the severity of anorexia nervosa (American Psychiatric Association, 2013) as well as to diagnose obesity and therefore the risk for heart diseases, diabetes and increased mortality, to cite a few (Campos, Saguy, Ernsberger, Oliver, & Gaesser, 2006). Thus, today as in Quetelet’s time, it is best to opt for the average weight. However, Quetelet never intended his index to be used on individuals (Bogin & Varela Silva, 2012). The usual suspects of gender, ethnicity and age, as well as variations in human physique all affect the accuracy of BMI when applied to an individual (Bogin & Varela Silva, 2012; Gard & Wright, 2005). In spite of this, studies that try to establish a correlation between BMI and various health problems (Mudry, 2009), or behaviours such as TV watching (‘obesogenic environment’) (Gard & Wright, 2005) are common. Through pervasive talk about BMI and its links to health, we are not only as Oliver (2006, p. 121)

states ‘encouraging people to think that health and wellness are equivalent to being thin’, but also imply that health and factors affecting it are easily quantifiable.

3.4.2 THE BIASED INDUSTRY TOOL - HEIGHT AND WEIGHT TABLES

Before BMI was adopted in the 20th century, another quantitative tool was used to determine weight’s impact on health and mortality, namely weight-for-height tables.

These tables were used by the industry most relying on quantification and statistics – insurance companies – to determine insurance premiums. Wishing to have more healthy customers who would pay premiums for longer, insurance companies tried to establish the healthiness of applicants through certain characteristics, and weight was considered as an indicator for health (Czerniawski, 2007; Rothstein, 2003). Huff (Huff, 2005, p. 46) argues that reduction of the body to ‘a series of equations between diet, weight, and life span’ by insurance companies that started in the 19th century echoed a more common wish to reduce corporeal anxiety by giving the fantasy of knowledge about, and therefore control over, the dynamic body’s tendency toward death’. This could be equally applied to today’s use of the same calculations in the self-tracking technologies such as MyFitnessPal.

Unlike today, in the 19th and early 20th century thinness was seen as a sign of weak health, as it was often related to tuberculosis, while plumpness signalled reserved that could be used when ill (Weigley, 1984). Though too much corpulence could result in higher premiums (Schwartz, 1986, p. 89). In 1846 British surgeon John Hutchinson published a table of average weights for height of 30-year-old men, perceiving this material as useful to medical professionals trying to detect ‘inroads of disease’ (Hutchinson cited in Weigley, 1984, p. 417). Soon the table with some revisions was used as a guidance by life insurance industry (Weigley, 1984). No uniform standard for approaching the weight as a health risk meant that customer could be denied coverage in one company and then accepted by another (Czerniawski, 2007, p. 278). To address the issue a table, known as ‘Shepherd’s

table', was developed in 1897 and adopted across the industry in the US (Czerniawski, 2007; Weigley, 1984). It gave the heights and weights for different age groups based on 74,162 male applicants accepted for life insurance in the United States and Canada, and 20 percent variation from the average was suggested as signalling risk (Czerniawski, 2007, p. 279; Weigley, 1984, p. 417). With limited information on women, it was calculated that 'women were 6 to 9lb lighter than men of similar height at age 25' and that the difference diminished over age and became identical at around age 45-50; insurance companies used this information as a rule of thumb (Weigley, 1984, p. 418). Subsequently, more of improved tables were developed: when more women entered the workforce, the tables included women as well and to minimise the inaccuracies chest measurements were added (Czerniawski, 2007). The medical profession was also interested in weights relation to health, but collecting large-scale data was too complicated for, at the time, unorganised community, therefore life insurance industry established itself as an authority in height and weight tables (Czerniawski, 2007, p. 285).

In 1942 the Metropolitan Life Insurance Company produced a table of suggested ranges of *ideal* weights with regard to frame size for women 25 years and older. Due to the public interest, a table of ideal weights for men was devised a year later (Czerniawski, 2007, p. 288). The ideal weights were based on the calculation of Dublin – a statistician in the company – that the closer one's weight was to the average weight of twenty-five-year-old, the longer the person will live (Oliver, 2006, p. 19). Dublin was highly convinced that being overweight is bad for health and spent a lot of his time not only researching statistical data to prove his point, but also giving talks and writing articles about the threat of overweight (Gaesser, 2013). Similar desirable weight tables published in 1959 were taken up in early obesity research in Britain and the Framingham Study in the US (Fletcher, 2014, p. 341). Thus, a statistical tool designed to calculate economic gains for

insurance companies gradually became incorporated in the medical as well as wider social understanding of health. Weight was not only an indicator of one's insurance premium, but it also indicated one's health. Thus, concerns about changing it grew. The non-fatalistic view of death that emerged in the nineteenth century made acceptable the 'idea of altering weight according to a table's recommendation in order to improve mortality rates' (Czerniawski, 2007, pp. 285–286).

The tables are problematic, as pointed already in 1954 by an actuary from the same Metropolitan Life Insurance Company that used them extensively (Weigley, 1984, p. 422). The insurees on which the tables were based are dominated by white, middle-class men with no chronic conditions are not representative of the population as a whole. This relates to tools like MyFitnessPal that rely on quantification of the body to suggest the daily calorie limits. The information gathered from the user is very limited – gender, weight, ideal weight, height and activity levels. Yet the app can suggest an optimal number of calories required to achieve weight goals based on this information, despite the vast variation of characteristics, like metabolic rate, which exists among MyFitnessPal users.

3.5 Conclusion

In this chapter, I have outlined the development of the three entities – calories, BMI and height and weight tables – that today shape how we understand and regulate our food and nutrition. From the onset, their nature was ambivalent – based on inferences they were meant to suggest the ideals (ideal diet or body weight) and designed by the scientists and professionals they were supposed to direct the lay people. Despite this ambivalence, the three entities (or at least ideas they support) remain popular to the extent that we guide our weight loss by them.

As shown, at the beginning of their existence in nutritional science calories were important as means to ensure wholesome diet, in particular among the poorer classes. The concept of calories stems from a wish to educate the labourers, and though calories were ‘born’ in the lab, they were intended to be thought about in the kitchen. The existence of technologies like MyFitnessPal shows that this endeavour was quite successful. Calories have entered our perception of foods and made communication about food in numerical terms reasonable. MyFitnessPal, though an extreme case, is a good example of this as it encourages to make decisions about food based on their caloric and nutritional value.

The popularity of BMI and height and weight tables is troublesome mainly because these tools were either used inaccurately or based on inaccurate premises. BMI was not intended to be used with individuals; it only describes populations. The height and weight tables represent a limited set of population and cannot be seen as accurately identifying the ideal height and weight of different groups they claim to cover.

If calories helped to quantify food’s worth, then BMI and height and weight tables ended up quantifying health and wellbeing through their application in health studies and the definition of obesity. MyFitnessPal illustrates that concerns about ‘right’ weight that made BMI and height and weight tables popular remain ever present. MyFitnessPal seems to signal the continuity of intentions to quantify body weight, and control and ‘perfect’ it through this quantification.

Height and weight tables can be seen as becoming ‘accidentally’ popular – intended for an office use they spread among wider society. But this happened precisely because the context made them meaningful tools to evaluate yourself against. The popularity of MyFitnessPal indicated by the millions of users attests that today context has not changed

that much – we find the tools like MyFitnessPal and ideas that are guiding them meaningful.

The discussed history points to the fact that the self-tracking tools we choose, such as MyFitnessPal, are not neutral even though their reliance on numbers seems to indicate their objectivity. The science that made technologies like MyFitnessPal possible and relevant was and still is influenced by cultural and political ideas (even if they are old ones), and these become implied in technologies.

CHAPTER 4

METHODOLOGY

4.1 Introduction

The purpose of this study is to provide a better knowledge of self-tracking practices in everyday context as it is done by users who are not part of a self-tracking community.

Thus, so far, I have described the background and influences of this study, and detailed its aims. I have provided an outline of existing literature on self-tracking highlight the points of convergence between the previous studies and this thesis as well as the gaps that it aims to fill. Furthermore, I have discussed the development three entities that underpin the meaningfulness of technologies such as MyFitnessPal.

This chapter presents the methodological approach and research methods that were adopted to achieve the aim of this study. I start by explaining my methodological stand, mainly the use of constructivist grounded theory method. I further outline the recruitment and interviewing processes of a total of 31 participants. I follow up with a reflection on possible influence on the data collection that I could have made. I finish the chapter by explaining my approach to data analysis.

4.2 Constructivist Grounded Theory Method

Before further outlining the methods used in this research, I will review grounded theory, from its origin in Glaser and Strauss (1967), subsequent controversies, and the emergence of the constructivist grounded theory method by which my research project was guided.

The original grounded theory method as defined by Glaser and Strauss (1967) and the approach to it further developed by Glaser (1998) adheres to positivist ontology as it assumes a 'single reality that a passive, neutral observer discovers through value-free inquiry' (Charmaz, 2008, p. 401). It seeks to use research data to find grounds for prediction and control of behaviour and proposes rigorous methods for achieving this aim (Bryant, 2002; Bryant & Charmaz, 2010; Charmaz, 2008; Thornberg & Charmaz, 2014). Hence, despite its embrace of qualitative methods as providing valuable insights for generating theory about social world, original grounded theory essentially wants to extend objectivist perception of quantitative data to qualitative by seeing it as neutral and objective, and failing to recognise the importance of research (and researcher's) context (Bryant, 2002).

The constructivist grounded theory method builds on practices and guidelines of the 'classic' grounded theory method developed by Glaser and Strauss (1967). However, it has different ontological and epistemological underpinnings that reject the scientism and take into consideration the epistemological shifts that occurred after the 'discovery' of the original grounded theory (Bryant & Charmaz, 2010). Constructivist grounded theory method is entrenched in interpretivist ontology and pragmatist and relativist epistemology and is more critical to ideas about objectivity in research and findings (Thornberg & Charmaz, 2014). The 'original' grounded theory method perceives data as a real representation of the world, does not focus on how it is shaped and aims to find the 'truth' and rules about the world studied and argues that theories emerge from data (Bryant, 2002). Under the constructivist grounded theory method the data and their meanings are not discovered but are *constructed* by the researcher and participant, are temporally located in their interaction, and depend on 'cultural and structural contexts' (Charmaz, 2000, p. 524, 2006; Thornberg & Charmaz, 2014). Instead of finding the truth, this method

tries to understand the reality as the experiences and practices of those being studied are real, whether or not we believe in ‘unidimensional external reality’ (Charmaz, 2000, p. 521). Therefore, the findings of research based on constructivist grounded theory method are not providing ‘objective’, generalizable description of the world ‘out there’. Rather, it offers ‘an interpretive understanding of the studied phenomenon that accounts for context’ that integrates participants’ perceptions and voices (Charmaz, 2008, p. 402).

The ‘original’ grounded theory method sees researcher as the neutral expert (Bryant, 2002; Charmaz, 2006). The constructivist approach rejects this position of authority arguing that participants’ voices are essential in research analysis and presentation of constructivist grounded theory method because participants play a part in constructing the meanings of the data (Charmaz, 2000). Therefore, when adopting this method, one needs to enable ‘participants’ accounts to retain a degree of visibility in the text so that the reader can make the connections between analytical findings and the data from which they were derived’ (Mills, A., & K., 2006, p. 7). Nonetheless, the interpretation presented rests on the researcher’s perspective, which in turn is embedded in particular social, cultural and historical context. Researchers, therefore, are willy-nilly selective in what they see in data (Charmaz, 2006). Thus, researchers need to be aware of their positionality and be reflexive about how they as well as their research participants influence the research outcomes (Charmaz, 2006, 2008).

The ‘original’/‘classic’ grounded theory method argues that literature should be reviewed at the final stages of research and research should be approached without any theories in mind in order to prevent ‘contamination’ of data collection and interpretation, and to protect the unbiased, objective view of researcher (Bryant, 2002; Thornberg, 2012).

Whereas constructivist grounded theory method sees this approach as naïve (because researcher is always already influenced if not by theoretical than by social and cultural

inclinations), not practical (a topic that has been researched before could not be researched again as researcher already has theoretical knowledge about it) and not helpful for acquiring the best understanding of the phenomenon under study (Thornberg, 2012; Thornberg & Charmaz, 2014; Timmermans & Tavory, 2012). Instead, it advocates, what Thornberg (2012, p. 249) refers to as ‘informed grounded theory’ where research is ‘grounded in data by GT methods while being informed by existing research literature and theoretical frameworks’. This approach helps to formulate relevant research questions, enhances the analysis and makes researcher more critical about the evolving and existing ideas (Thornberg, 2012). In other words, informed grounded theory argues that ‘There is a difference between an empty head and an open mind’ (Dey 1999, 251). Nonetheless, researchers should remain critical and reflexive about the (possible) impact of their existing knowledge and inclinations towards particular theories to the research findings (Charmaz, 2008). Engagement with the literature should be an interactive process where literature leads to going back to fields and asking new questions, while data guides back to certain literature; hence, a literature review is an ongoing process (Thornberg, 2012).

My research project was guided by grounded theory method (see Bryant 2002 for an explanation of the importance of talking about grounded theory method, rather than grounded theory), and in particular its constructivist strain. I emphasise that it was only guided by it and not based on it. Despite method’s centrality to my research endeavours, because, even if Thornberg and Charmaz (Thornberg & Charmaz, 2014, p. 154) state that constructivist grounded theory method’s ‘methodological strategies [are] flexible guidelines rather than rigid prescriptions’, I used them as strategies of interrogation, rather than as means of arriving at theoretical conclusions. Hence, in the words of Charmaz (Charmaz, 2008, p. 401), my study is not of the ‘few grounded theory studies [that] build theory’, but one that aims to ‘provide an analytic handle on a specific experience’.

4.3 Data collection

As Miller and Glassner (1997, p. 100) argue, if research aims to study others' perceptions, it should use qualitative interviewing 'because it provides us with a means for exploring the points of view of our research subjects while granting these points of view the culturally honoured status of reality'. Hence, qualitative interviewing was seen as an ideal way of gathering data for this study, as it provides a chance to observe and analyse how the meanings are constructed, attached and related to wider cultural values and discourses (Kvale & Brinkmann, 2009). This research has used semi-structured interviews, as they not only allow interviewees to answer on their own terms but also provide space for structured questions that allow for comparability (May, 2011, p. 134). The information obtained through qualitative method cannot claim to be generalizable, as it aims to access 'cultural categories and assumptions according to which one culture construes the world' rather than discover the number and description of people who share particular values (McCracken, 1988, p. 17).

4.3.1 RECRUITMENT PROCESS AND PARTICIPANTS

After preparing interview questionnaire, which was largely based on the questions that have arisen from the exploration of current literature on self-tracking and its shortcomings, I conducted a pilot interview to check whether the questions were well formulated. After this proved the interview schedule well formulated I began recruitment.

I deliberately did not want to study people from QS or other self-tracking community and wanted to avoid recruiting only university students to garner the perspectives of the early/late majority rather than the vanguard or innovators (Rogers, 2003). Everyday self-trackers can be difficult to recruit, as tracking is largely an individual and sometimes private practice. Therefore, I first used Google Maps to locate gyms in the East Midlands

area and emailed personal trainers working there. I have also gone to few gyms and asked around there, whether they know if their clients use MyFitnessPal and if they could introduce me to them. In total, around 70 gyms or personal trainers were contacted. The majority did not reply, some have replied stating they are not using MyFitnessPal or food diaries in general, and do not know if their clients use them on their own. This recruitment strategy resulted in meetings with five personal trainers in the Midlands region and one in London. Three of the personal trainers tried to get me in touch with their clients who have used MyFitnessPal. However, this was largely unsuccessful. One personal trainer was a Lithuanian living in the UK for more than two decades and was enthusiastic about meeting and later about helping to recruit. I think being from the same country and living as immigrants in the UK was helpful to establish rapport and for her to take the effort to introduce me to some of her clients. She has posted a Facebook post on her personal wall saying she has an interesting offer for people using MyFitnessPal. As she had many of her former or present clients as friends on Facebook, several have replied to her post. Then she would put those who did together with me in private message, saying that I am doing research on MyFitnessPal and I would like to interview them about their experience. I found this a little deceiving and leading people to sign up for something they are possibly not interested in. However, I tried to explain my research to those who I was put in contact with and for those who expressed an interest to participate, I sent them the information sheet which stated that they could decide not to participate or leave the study whenever they want. This way I recruited and interviewed four people.

I also posted invitations to participate in the research on local fitness, dieting and running as well as British MyFitnessPal users' Facebook groups. Some members of those groups were just asking questions about the research, two responded by a private message, and after getting more information about the research from me and receiving information,

sheets decided to participate. One member referred her friend to me whom I contacted by her personal e-mail.

Later I posted recruitment ad on a participant recruitment website callforparticipants.com that remained on the website for around six months, and several participants were recruited through it.

Moreover, I got in touch with few personal trainers on Facebook, sending the same information through a private message that I send to gyms and other personal trainers by e-mail. One personal trainer posted a message on his professional wall about my research sharing the web link to The Call for Participants website of my research. However, he described it as a survey and then when several people got in touch with me through the website, and I send them an e-mail explaining what the research would entail no one replied. I asked him to change the message as I thought that the word 'survey' was misleading. However, even when he did that, the few people who got in touch with me stopped replying once I described what it entails. Another personal trainer invited me to post on local cross fitters' closed Facebook group. I posted the same post I posted in the earlier contacted fitness and running groups. Two people have responded, and one later referred his friend.

Finally, when after three months I was not able to recruit any more participants, I posted a recruitment ad on a web bulletin board for Loughborough University staff and students as well as on the university's postgraduate research students' Facebook group for methods. Six people have replied and were interviewed.

The only criterion for participation in all of the recruitment posts and ads was the previous or present use of MyFitnessPal. The mentioned groups of people were selected for contact because it was impossible to contact individual users of the app and these groups seemed

to be most likely to have at least encountered these kinds of technologies. However, this approach also posed a risk of skewing population with too intense, athletic and actively dieting users. Moreover, due to the recruitment aim to avoid recruiting QS members and the strategy it entailed, the recruitment depended on the self-selection and, therefore, is not necessarily representative of the population who is using MyFitnessPal.

Nonetheless, I ended up recruiting quite a heterogeneous group of MyFitnessPal users that included not only active cross fitters and muscle builders who were actively tracking their nutrient intake, but also people who were trying to lose few kilograms and were using MyFitnessPal on and off. Broadly, the participants can be categorised into three broad groups. The first and largest group of participants consisted of people wishing to lose weight, who engaged in some physical activity but not particularly actively (n=21). The second group was sports enthusiasts, who were actively involved in sports or fitness, but were not professional athletes (n=4). The third group of participants were personal trainers or gym managers, who provided useful information about how they adopted MyFitnessPal in their work (n=6). The dieters and sports enthusiasts talked about their own experiences, whereas the personal trainers talked mostly about how they used the app with their clients.

A total of 31 participants were interviewed: 12 men and 19 women. They were mainly in their early midlife, ranging from 22 to 53 years of age, with the average age being 37 years. All participants were based in the UK, and most were in East Midlands area.

Participants' occupations ranged from student and gardener to administrative managers and university professor. Details about each participant's age and profession can be found in Appendix E.

Before starting the research, an ethical clearance was obtained from Loughborough University following the guidelines provided for the research involving human subjects. I

have followed the requirements of Loughborough University Ethics Approvals (Human Participants) Sub-Committee and completed Loughborough University Ethics Approvals (Human Participants) Sub-Committee's Research Ethics Checklist, which indicated that my investigation is deemed to conform with the ethical checkpoints and to lodge the completed checklist with the Head of the Social Sciences Department at Loughborough University. Information concerning this can be found in Appendix A.

Participants were given an information sheet (can be found in Appendix B) explaining what the research entails and that they are free to leave the study at any moment as well as that their participation is anonymous. In what follows pseudonyms are used to ensure anonymity.

4.3.2 INTERVIEWS

I conducted the interviews in 2015 either face-to-face (n=28) with participants who were based in East Midlands or otherwise easily reachable location or through Skype video calls (n=3) for participants who live further in the UK and could not be met face-to-face.

Participants were asked to choose date and time that was most suitable for them to ensure their availability and minimise the chance of last minute cancellation or no-show. The face-to-face interviews usually took place in cafes of participant's choosing; some were met on the Loughborough University campus – in one of the cafes or a pre-booked room at the students' union.

Skype interviews were done with video mode to establish a better rapport and to be able to see and follow participant's body language. One interview was disrupted by bad internet connection and had to be continued with only the audio on; however, the participant did not seem to be affected by this, was open and friendly during the interview, maybe because we had talked for a long time with the video on. Participants who were

interviewed by Skype were asked to sign and scan or digitally sign their informed consent copies.

I would start the interview with some small talk about the location, weather or trip to the location. Then I would ask participants to have another look at the information sheet that I had sent them before the meeting and would ask to sign the informed consent form (can be found in Appendix C), which too had been sent to them beforehand. The interviews were semi-structured and consisted of five set of questions. The interview schedule can be found in the Appendix D. The first set of questions was purely a description of oneself, detailing the age and occupation. In the second and largest set of questions, participants were first asked to tell their story of using MyFitnessPal, after that more detailed questions and prompts were used to understand how participants were using and evaluating the app, e.g. when are they logging the foods and whether other people know about their use. In the third set of questions, participants were first asked to tell their opinion about the information MyFitnessPal provides and later asked to elaborate on the kind of information they are seeking and whether MyFitnessPal is useful for getting it and whether the information is accurate. In the fourth set, participants were asked about what 'health' means for them and how they are trying to take care of their health. Finally, participants were asked whether they think MyFitnessPal had any influence on them or their perception of food.

I would finish the interview by asking if the participant has any questions, which often resulted in me being asked whether I was in any way connected to MyFitnessPal company. The information sheet and consent form only had Loughborough University coat of arms and only stated my affiliation to the University. Hence I am not sure whether participants thought I was trying to deceive them or were plainly curious, and how these thoughts affected their responses.

The interviews were audio recorded with a permission of the participants' and transcribed verbatim by me soon after they took place. This ensured that body language, gestures and atmosphere was still fresh in my mind and provided a backdrop for the ideas in the text (Brinkmann, 2013). Moreover, it allowed improving questions as the research progressed as well as insured that analysis could be done while still collecting the data, as required by grounded theory method.

Before the collection of data, I explored the literature on video diaries, audio diaries, probe use and ecological momentary assessment for possible data gathering techniques I could supplement interviews with. This gave me few ideas of what additional techniques could accompany interviews. I opted for the diary (participants could select audio, video or written one) where they would write their thoughts at the moment of logging, whether about food or logging experience. I asked two people who used MyFitnessPal (one of which was later interviewed) to make such notes. This revealed that people had difficulty making the notes and somehow would mainly only justify their food choices for me, rather than provide details of their thoughts. Therefore, I decided not to ask for these kinds of notes of future participants and instead asked them to export and send me two-weeks' worth of their MyFitnessPal diary. This was not compulsory and resulted in 16 extracts.

The two-weeks' worth MyFitnessPal diary extracts were used to prompt participants to talk about their MyFitnessPal use practices and eating behaviours. They helped participants to provide more detailed accounts of their practices, as they had a starting point as well as helped me as an interviewer to explore topics such as measuring by providing examples from participant's diary.

4.4 Reflexivity: possible influences on answers, participants and me

The interview is a special kind of social interaction: irrespective of the type of interview one is involved in, the ultimate goal of the interaction is this acquisition of knowledge.

There exist different views on how that knowledge that goal should be approached.

However, irrespective of the approach, as the interview is a social interaction, the relationship between the interviewer and interviewee does play a role in this process. If we agree with Holstein and Gubrium (Holstein & Gubrium, 1995) that interview is co-construction of knowledge between two subjects, then the relationship between these two subjects becomes important. How they perceive each other and how they as a result of that relate to each other can be seen as important factors to the end product of the co-construction (Holstein and Gubrium 2003). Even if we see the interview as a situation in which interviewer extracts the ideas from the vessel-of-knowledge interviewee, the relationship between them remains important, as what can be extracted depends on how the interviewer establishes herself.

The interview is not a free dialogue between egalitarian partners (Kvale & Brinkmann, 2009), as it is based on power relations. The interviewer controls the interview; she states when it starts, finishes and navigates through themes and questions (ibid.) Hence, because the interview knowledge is relational and intersubjective (Hennink, Hutter, & Bailey, 2010; Kvale & Brinkmann, 2009), it is important to equate the power relation as much as possible and reflect on it in order to assure that interviewee's views are well heard and represented. As the interview is co-construction of knowledge and requires some relationship established, its outcomes can be influenced by the quality of the relationship. It, in turn, can be influenced by a myriad of factors such as age, ethnicity, gender, social status, language skills, etc. While I was aware that my gender, age and non-British

ethnicity and accent could make an influence on the way participants perceived me and tailored their questions, I also thought how, given the research topic – dieting app use, my appearance could also be a factor affecting the answers.

Discussing food and eating practices, at first sight, seems to be a neutral and everyday talk. However, culturally and historically specific codes are attached to food, and it becomes ‘charged’ with values (Coveney, 2006; Murray, 2008, p. 64). Despite historical evidence that food rules are never fixed and therefore are dependent on not necessarily objective scientific knowledge (Biltekoff, 2013; Coveney, 2006; Lupton, 1996), food rules are mostly taken for granted (Biltekoff, 2007). Steim and Nemeroff (1995, p. 481) suggest that concern with diet goes beyond motivation to be conventionally attractive or healthy; it has become a moral ruling. Hence, food can be a morally-loaded topic. It could be even more problematic if the participant deems herself or himself ‘overweight’ and the interviewer as ‘slim’ as both these body types have a moral value attached to them as well (Bordo, 1993; Gilman, 2010; Lupton, 2012a). With former bearing negative evaluations such as gluttony, unhealthiness and latter being seen as a sign of strong will and health. Therefore, as Rubin and Rubin (2005) recommend to interviewers and Charmaz (2006) to those using constructivist grounded theory method, I have tried to be self-aware of the impact I might have on the interview. I was trying to be aware of possible influence any of the factors mentioned above, be it my age or my appearance as a ‘slim’ person could have on interviewees answers, particularly about their eating and logging habits. After interviews, I made notes about how well they went, what possible mistakes I made and what interesting topics had arisen. Taking time to reflect on the interview when writing these notes was helpful for thinking about my role as a researcher, what was the atmosphere of interview and responsiveness of the participant, whether my socio-historical location was distorting the way I was approaching the topic and the participant

(Hammersley & Atkinson, 2007). Furthermore, making notes helped with understanding how some questions could be rephrased and the approach to some topics be improved in such way that I would not lead participants into answering questions in a specific manner. However, I could not know with certainty whether some or any answers were altered because of discussed factors.

After finishing the interviews, I reflected on my experience and the data collected, and it seems that there were no significant issues. However, few minor considerations arose, and I will reflect on them in what follows.

Before starting the study, I have used MyFitnessPal in a quite relaxed manner, mainly to understand how it works. But during transcription and coding of interviews, I started thinking that I want to try and use MyFitnessPal in a more rigid and structured way, similar to that of my participants, with hopes that this will help me lose weight. I have then used MyFitnessPal for a few weeks and started feeling that counting calories was a quite stressful experience. I would feel hungry and thought about food much more than usual. It seemed that my experience did not reflect that of my participants. All of their stories, even of people who were adhering to MyFitnessPal rigidly, were positive and no one mentioned experiencing hunger or thinking too much about food (except for one participant who had an eating disorder that was exacerbated by MyFitnessPal use).

Unfortunately, I started more intensive use of MyFitnessPal at the end of my study and was not able to raise questions about negative experiences. Nonetheless, when I did ask some participants whether they found using MyFitnessPal difficult or bothersome they usually denied this or talked about it as a minor annoyance rather than something as disturbing as I have experienced. I think the topic of negative experiences should have been more elaborated on and, hopefully, future research in this or similar self-tracking technologies will touch upon it.

Finally, many participants who were not using MyFitnessPal at the time of the interview have noted during or after the interview that speaking to me and discussing the use of MyFitnessPal makes them want to start using it again. It seemed that during the interview they reminded themselves about the usefulness of the app and the ease of using it. However, I am also wondering, whether their wish, conscious or not, to for whatever reason (e.g. thinking that I am working for MyFitnessPal company or wanting to present themselves as more rigid users) portray the app and its use in a positive way, could have distorted the data I have collected. I could have also made them perceive MyFitnessPal in a more positive light than maybe they saw it when they were using it, and possibly lead them into restarting the use.

4.5 Data analysis

There are three main reasoning approaches to data analysis, mainly deductive, inductive and abductive. The first two approaches are long-standing, guiding discussions on logics and science for a long time, while abduction is a more recent development of American pragmatist philosopher Charles S Peirce (Reichertz, 2010; Timmermans & Tavory, 2012). Deduction describes reasoning that follows from the theory, and that is verified by hypothesis, induction starts with observations from which conclusions are made, and abduction is the creative endeavour of hypothesising from surprising proofs encompassing both reason and observation (Reichertz, 2014; Scott & Marshall, 2005; Timmermans & Tavory, 2012). It is common to describe them as separate ways of coming to conclusion, but it can be argued that they are connected and are representative of qualitative research stages (Reichertz, 2014). Nonetheless, I argue that in my research abduction was a leading way of reasoning and coming to conclusions. In the next section, I explore abduction and explain how I engaged in it in my process of analysis.

In line with (informed) constructivist grounded theory approach, abduction requires researchers to be knowledgeable and aware of multiple theorizations to be able to know how the collected data fits within existing knowledge, what is anomalous in order to make insightful contributions (Timmermans & Tavory, 2012). While induction has long been seen as the essential logical approach to qualitative research, abduction has increasingly taken this position (Reichert, 2014). Illustratively, Reichert (2010, 2014) argues that research usually begins with doubt, the unbelief of finding things differently than we expect them to be, and hence with abduction that helps to connect with an old or create a new order that explains the unusual findings. Other qualitative researchers argue that abduction is not the initial stage of qualitative research analysis, especially that guided by the grounded theory method but only follows induction; however, it is still essential for the creation of ‘an imaginative interpretation of studied life’ (Charmaz, 2009, p. 137).

While I do not argue against the latter point, in my own research project abduction was an initial and central reasoning approach to data analysis. When collecting my data and after the collection was finished I found my data not fitting the existing explorations of self-tracking, hence was surprised and was seeking ‘a situational fit between observed facts and rules’ (Timmermans & Tavory, 2012, p. 171).

Mainly led by abductive reasoning I engaged in constructivist grounded theory-guided analysis of interview data. In more concrete terms my analysis consisted of coding of interview data. Charmaz (2006, p. 43) describes coding as ‘naming segments of data with a label that simultaneously categorizes, summarizes, and accounts for each piece of data’. To make the coding easier and codes more accessible and organised I used a computer-assisted qualitative data analysis software NVivo10. Following constructivist grounded theory approach, the analysis was a continuous process and was done from the start of data collection (Charmaz, 2000, 2006). I first did the initial coding, meaning that the data was

analysed soon after first interviews were collected and transcribed (Charmaz, 2006), which enabled me to think about these initial findings and ask questions about them when conducting further interviews. During the initial coding, I aimed for more descriptive aspects and incidents, as suggested by Charmaz (2006), remaining theoretically open. This was later followed by focused coding, where frequently occurring initial codes were combined and synthesised and used to sort the data (Charmaz, 2006). During this episode, coding was more selective and influenced by theoretical ideas that I was directed to by the initial coding. Both of the stages included the constant comparative method (Charmaz, 2006; Glaser, 1965; Glaser & Strauss, 1967) comparing data with data, different parts of the same interview and incidents to incidents. This allowed to ‘make analytic sense’ (Charmaz, 2006, p. 54) of the collected interview data. Some codes and themes they delineate were more apparent than others. For example, the mundanity of self-tracking described in Chapter 5 stood out from the initial coding, while the focused codes for the Chapter 7 were not so apparent – though the data pointed that there ‘was something in there’, it was not easy to distil what exactly was going on. During both stages, but somewhat more during the initial coding, I wrote notes akin to memos in grounded theory. Memos constitute an intermediate stage between data collection and writing drafts of analytical papers that is oriented towards early analysis of the data, and that help to think about data (Charmaz, 2006). I write ‘akin to memos’ rather than ‘are memos’ because I think they lack the structure and intentionality of memos, as described by Charmaz. I did not write different early and advanced memos (Charmaz, 2006, pp. 80–81), but rather wrote down ideas about some codes and topics when analysing and wrote early, loose drafts of chapters later. Nonetheless, these notes and draft were a similar space of free-floating ideas and exploration as memos are supposed to be. I also often made mind maps trying to see how different topics and their aspects are connected, and in which ways.

The initial coding pointed to two main themes: mundanity and practices. When data collection was finished, I moved to focused coding, which confirmed two earlier established themes and also revealed new one - the quantification of food. In the following chapters, I will discuss these three themes in depth.

CHAPTER 5

THE MUNDANE EXPERIENCE OF EVERYDAY CALORIE TRACKERS: BEYOND THE METAPHOR OF QUANTIFIED SELF

‘The quantified self (QS) is any individual engaged in the self-tracking of any kind of biological, physical, behavioral, or environmental information.’

(Swan, 2013, p. 85)

‘The term “quantified self” is now frequently used not only in relation to members of the Quantified Self movement itself, but more generally to refer to the practices of self-tracking or lifelogging.’ (Lupton, 2013d, p. 26)

‘As a metaphor, the [quantified self] does not only define a new numerical self but also promotes a framework within which such a self operates. From this perspective, *Wired* is using the notion of the QS to capture certain interests and desires for the future, while ignoring and downplaying others.’

(Ruckenstein & Pantzar, 2015, p. 2)

5.1 From Self-Tracking to the Quantified Self Metaphor

People have long been keeping track of their food consumption, weight and performance changes. However, more detailed and nuanced ways of self-tracking have become possible through the emergence of new and increasingly more intelligent devices, which include wristband pedometers, sleep trackers, fertility trackers and many more. Every year more technologies and apps that help track various aspects of health and bodily performance are released to the market (Statista, 2015) and now wristband pedometers that synchronise

with your mobile phone can be found in supermarkets. This demonstrates that self-tracking, once the domain of a small group of enthusiasts, has become popular among the wider population.

Self-tracking is also at the centre of the Quantified Self (QS) movement, which started in San Francisco but has spread world-wide. QS is based around the idea of ‘self-knowledge through numbers’, i.e. has the aim to use new self-tracking technologies to quantify as many aspects of your life as possible (number of steps walked, calories consumed, hours slept, stress levels experienced, and so on) and to use this new knowledge to change, and improve, your life. Members of the QS community share their experiences on and off-line and often have taken self-tracking to the next level by inventing new technologies or thinking of innovative ways to use existing technologies (Choe et al., 2014; Li et al., 2010; Wolf, 2010).

The practices and experiences of the QS community are often evoked when self-tracking is discussed in the media (Cha, 2015; Weintraub, 2013). In fact, QS has often become conflated with self-tracking in general (Lupton, 2013b, p.26), which has not always been welcomed by the QS community itself (Neff & Nafus, 2015). According to Ruckenstein and Panztar (2015), QS has become an ‘ontological’ metaphor for self-tracking, it is used to categorise and identify key aspects of this new phenomenon (Lakoff & Johnson, 1980). As scholars in science and technology studies (STS) have shown, metaphors of new technologies are powerful tools, since due to their ability to resonate in different contexts they can offer common ground for discussion (Cohen & Blavin, 2002; Hellsten, 2003; Wyatt, 2004). However, metaphors are also limiting, since they only reflect a particular understanding of technologies (Hellsten, 2003). For example, discussions of new technologies often use metaphors that evoke ‘revolutionary’ changes, like computer or information revolution’ (Winner 1986 in Wyatt, 2004, p. 253). Ruckenstein and Pantzar

(2015, p. 2) also note that QS is associated with ‘disjuncture’ in articles published in the *Wired* magazine, which employs the metaphor to ‘model’ an emerging data driven market, full of promise.

Ruckenstein and Pantzar (2015) identify four aspects at the heart of the QS metaphor, namely the idea of transparency in the quantified world, the wish of optimizing health performance, the possibilities of feedback loops for behaviour change, and the idea of biohacking discoveries. Through a critical analysis of the arguments in the *Wired* articles, Ruckenstein and Pantzar demonstrate how the metaphor misleads us in our understanding of the everyday practices of self-tracking or ‘what the sharing, analyzing, and discussing of personal data promotes in the everyday’ (2015, p. 2).

To complicate the very selective picture of self-tracking, I shift the focus in understanding self-tracking from members of the QS community to people who engage in self-tracking, but without being part of any wider ‘movement’. The present work follows in the footsteps of earlier scholarship on internet use, which has emphasised the importance of studying users, who engage with the technology in a limited manner or do not use it (e.g., Henwood et al., 2003; Wyatt, 2003). These scholars have warned about the dangers of focusing on keen users, such those participating in peer-to-peer online health groups, and ignoring users who confine their use of technologies or reject them. Neglect of less avid user groups risks buttressing dominant discourses, such as the idea that Internet leads to patient empowerment.

For example, Henwood et al. (2003) observed that middle-aged women, who were making decisions about taking hormone replacement therapy (HRT), used the Internet together with many other sources, such as doctors, family and books, to find information. Many also did not consult the Internet, sometimes because they did not want to take the

responsibility or burden. Similarly, Nettleton, Burrows and O'Malley (2005) noted that parents of children with chronic conditions presented themselves as 'sensible' users of the Internet, accessing 'reliable' biomedical information, which ran counter to arguments celebrating Internet as fostering lay expertise.

Whilst Internet use was imagined as revolutionising health in the early noughties, self-tracking is currently associated with similar extraordinary expectations in the discussions on QS. Thus, to widen our understanding of self-tracking I studied, what Bakardjieva and Smith (2001, p. 68) – drawing on De Certeau (1984) and Schutz & Luckmann (1973) – have called 'ordinary man and woman' and what I, in the present case, refer to as 'everyday self-trackers': people who have downloaded or purchased an app (in this case, MyFitnessPal) and are using it on their own without belonging to any movement. Their experiences reveal a rather different picture of self-tracking than the one offered by the QS metaphor.

I identified three key themes related to self-tracking in the interview material, which contrast with the way in which self-tracking is typically talked about in the literature: goals, use, and effects. The literature that I reviewed includes visionary or conceptual work on Quantified Self as well as studies on the practices of actual members of the QS community (QSers). The differences between the interview material and the QS metaphor are synthesised in Table 1.

In the next section, I will discuss the left side of the table through an analytic literature review. After describing the methods of data collection, the 'Findings' section will describe the right side of the table.

Table 1 Comparison of QS metaphor and everyday calorie trackers

	Quantified Self Metaphor	everyday CALORIE trackers
Goals	<ul style="list-style-type: none"> • ‘Self-knowledge through numbers’ (Ruckenstein, 2015; Schüll, 2016; Swan, 2012a) • Self-optimization (Choe et al., 2014, p. 1147; Lupton, 2016b; Ruckenstein & Pantzar, 2015; Sharon & Zandbergen, 2016; Whooley et al., 2014, p. 154) 	<ul style="list-style-type: none"> • Lose (sometimes maintain) weight • Mainly to look better and sometimes to be healthier
Use	<ul style="list-style-type: none"> • Critical approach to data, norms and suggestions (Lupton, 2013d; Nafus & Sherman, 2014; Neff & Nafus, 2015; Ruckenstein & Pantzar, 2015; Sharon & Zandbergen, 2016) • Hacker tinkering with the hardware, software and analytical categories set by tracking tools (Choe et al., 2014; Ruckenstein & Pantzar, 2015; Sharon & Zandbergen, 2016; Whooley et al., 2014) • ‘Lay scientist, exploring retrospective data for trends and patterns to calculate optimal choices (Choe et al., 2014; Lee, 2014; Ruckenstein & Pantzar, 2015; Whooley et al., 2014) 	<ul style="list-style-type: none"> • Trust in data as expert knowledge • Using basic functions, rarely exploring advanced features of the technology • Prospective looking at daily calories or app’s prognosis of possible weight loss
Effects	<ul style="list-style-type: none"> • Using data to create self and the future (Lupton, 2013a, 2013d, 2016b; Sharon & Zandbergen, 2016; Swan, 2013) • Self-quantification as a way of living (Choe et al., 2014; Ruckenstein & Pantzar, 2015; Schüll, 2016) 	<ul style="list-style-type: none"> • Perceiving foods as calories and becoming more aware of eating habits • Temporary use and effects, calorie counting dropped when app not used

5.2 QS as metaphor

5.2.1 GOALS

The literature on QS relates the goals of self-tracking to the pursuit of *transparency* and *self-optimization*. These two principles come together in the QS slogan ‘self-knowledge through numbers’.

The idea of transparency is predicated on the idea that people are ‘data-hungry and eager to take advantage of the growing amounts of data generated by sensors, satellite images and search engines’ (Ruckenstein & Pantzar, 2015, p. 7). These new forms data can be harvested through self-tracking and used to make the world and the self increasingly more transparent. For example, Swan states that the reason for an individual to get involved in quantified self projects was ‘to understand his or her own patterns and baseline measures and obtain early warnings’ (Swan, 2012a, p. 95). Schüll (2016, p. 9) identifies a similar sentiment in statements of the wearable tech industry, which promise that these products ‘help fill in the blind spots and take the guesswork out of everyday living.’

The QS quest for minutiae data about all facets of life is driven by the wish for optimisation. Data is perceived as enabling improvement of diverse aspects one’s life and body. Lupton (2016b, p. 64) notes that self-tracking is portrayed as a pursuit for ‘an optimal human being’, while studies of QS members show that they want to ‘improve health, maximize work performance, and find new life experiences through self-tracking’ (Choe et al., 2014, p. 1147) and are driven by ‘self-improvement and curiosity’ (Whooley et al., 2014, p. 154). Sharon and Zandbergen (2016, p. 2) point out that literature, which is critical of QSers, also depicts them as driven ‘by a desire to control and optimize the overwhelming complexity and uncertainty of life.’

In contrast with these goals of obtaining vast quantities of data to render life and performance transparent and knowable, the participants had a more specific, and limited, goal, mainly losing weight. They wanted to lose weight to look better, and sometimes to be healthier. Whilst losing weight is a type of self-improvement, it is more modest, and more traditional than the expansive goal of ‘optimising’ different facets of the body, self and life. Hence, while the QS metaphor in the literature makes self-trackers to stand for a ‘data-driven health revolution’ (Ruckenstein & Pantzar, 2015, p. 8), I found the participants to be driven by more specific, modest, and less novel mundane goals.

5.2.2 USE

The discussions on QS give a picture of highly creative, critical, and innovative use. This is encapsulated in the notion of ‘biohacking’ (Ruckenstein & Pantzar, 2015), whereby self-trackers experiment with their data and bodies to find their individual indicators of wellbeing. Biohacking presents self-trackers as actively questioning the data provided by self-tracking devices in order to find the purpose of personal data and to ‘seek to control their “data selves”’ (Lupton, 2013d, p. 29). QS can be seen as shifting attention from the normal curve to ‘what is normal for me’ (Neff & Nafus, 2015).

The image of a hacker emphasises a sense of creativity and personalisation (Ruckenstein & Pantzar, 2015, p. 10). QSers do not just (passively) use self-tracking technologies, they adapt, change, tweak, and alter them. The image of the user, emerging from studies of QS, is one of a creator who ‘built their own tools’ even if ‘numerous commercial self-tracking tools are available’ (Choe et al., 2014, p. 1149) or ‘wrote software programs that could extract data and integrate it into a representation they were happy with’ (Whooley et al., 2014, p. 155).

This critical way of studying yourself has led to a view of self-trackers as lay, or $n = 1$ (Nafus & Sherman, 2014; Sharon & Zandbergen, 2016), scientists. According to this view, self-trackers explore their data, experiment with their bodies (Lupton, 2013d) and ‘consider and address issues related to the scientific soundness of [their] projects’ (Swan, 2013, p. 92). Self-trackers are thus not just seen as creative, they are also portrayed as highly critical.

The participants, rather than ‘hacking’ the app, typically relied its basic functions. Many of them were not aware of, or interested in, using the more advanced features of the technology, let alone going ‘beyond’ them. The participants did not think about new ways of using the collected data. In fact, they rarely even looked at the historical data to identify trends or learn about their body. Instead, they tracked prospectively, looking at calories for the day or at app’s prognosis of weight loss. Furthermore, rather than adopting a ‘critical’ or ‘sceptical’ attitude, the participants basically trusted the data provided by the app. In other words, they did not seek further data or compare different data on e.g. embodied experiences.

5.2.3 EFFECTS

At the heart of the QS metaphor is the idea that self-tracking contributes to the creation of a new kind of self, the ‘quantified self’ (Swan, 2013: 95). The use of, and experimentation with, these new forms of data leads not just to a new self, but a ‘better’ self. The new knowledge brought by self-tracking is contributing to the self-creation. Tracking is presented as ‘means of enabling the constant creation of the self’ (Swan, 2013, p. 95), seen to happen through the interpretation of the quantitative data, or the ‘qualitative’ part of QS (Lupton, 2013d, p. 29, 2016b, p. 112). This interpretation, together with experimentation is seen to ‘transform the quantified self into an improved “higher quality” self’ (Swan,

2013, p. 93), who has a better understanding of itself than the ordinary one. The data and its interpretation are often highlighted as serving an important role in the ‘continuous process of identity construction’ (Sharon & Zandbergen, 2016, p. 11). Hence, Lupton (Lupton, 2013a) argues that ‘self-tracking represents the apotheosis of self-reflexivity’ geared towards making ‘choices about future behaviours.’

Self-tracking is seen as not just leading to the creation of a new self, but to a whole new way of living – ‘the data-driven life’ as put by one of the QS community founders Gary Wolf (2010). Self-tracking, and gathering quantitative information about yourself, is thus not just a method of data collection, but ‘an *approach* to better life’ (Choe et al., 2014, p. 1147). In fact, it becomes ‘a mission in life’ (Ruckenstein & Pantzar, 2015, p. 7). This mission is to gain as much knowledge about as many aspects of your life so that you improve your life in various ways. As Schüll puts it: ‘we are invited to view ourselves as longitudinal databases constantly accruing new content’ (2016, p. 9).

The participants of the present study did not perceive the data they tracked as contributing to the creation of a new self or identity. They *did* start to look at food differently and used their new knowledge about the calorie content of food items to restructure their meals, but this did not constitute the beginnings of a new, ‘data-driven’, way of life. Furthermore, for the participants self-tracking was not a long-term, or life-encompassing, activity. Self-tracking was something that they engaged in on a temporary basis when they needed to lose weight. Calorie tracking with the app was typically stopped after a while, and the participants would return to their usual eating habits.

The depiction of self-tracking in terms of QS metaphor has not been unquestioned and there have been a few studies that have provided insights into the practices of more ordinary self-trackers that go against the grain of the metaphor. For example, Rooksby et

al. (2014) interviewed people, who self-tracked physical activity. Their participants often used apps for short periods to help achieve long-term goals, perceived tracking as ‘prospective’ (Rooksby et al., 2014, p. 1171) and were not interested in reviewing the collected data. Similarly, Niva (2015) interviewed women using online weight-loss programs. Like participants in my study, these women did not question the usefulness of calories or the science behind the program. Though they were keen and expected calorie counting to become their lifestyle, many women eventually lost the motivation to continue, showing that self-tracking does not necessarily become ‘a mission in life.’ My findings below contribute to creating a more inclusive and nuanced notion of self-tracking than the one offered by the QS metaphor.

5.3 The everyday self-tracking

5.3.1 ORDINARY GOALS

When asked to tell their story behind MyFitnessPal use, participants would usually mention that they were self-tracking to achieve a specific weight goal, mainly weight loss. Gemma, a sound engineer in her late twenties, was typical in this regard since she wanted ‘just to track, track mostly food intake for trying to lose a bit of weight [laughs].’

Similarly, Julie, a graphic designer in her twenties, wanted ‘to lose weight, cause [I have] gone out of shape and obviously wasn’t eating the right stuff.’

The reasons for wanting to lose weight varied. Many wanted simply to look and feel better. For example, Anamaria, a postgraduate student from Romania, stated:

I wasn’t happy with weight, especially because I was eating a lot of sweets and not working out, I started having like huge sort of, like a doughnut ring

or something [around my stomach], [...] And the clothes sort of didn't fit very well, they were like tighter.

Some users aimed for a one-off, figure-changing weight-loss, like Serge, a sound recordist in his forties, who was preparing for his wedding and wanted 'to lose a lot of weight, [to] look good at the wedding pictures.' Others used MyFitnessPal occasionally when they felt like they needed to lose a few kilograms. Sometimes this was done in preparation for a holiday or celebration, as explained by Justine, a 36-year-old project manager, who used MyFitnessPal for 'those kinds of holidays, birthdays, uh gonna be in a bikini, erm... on holiday with friends, don't want to show myself up type of thing.' Thus, similarly to self-trackers in Cordeiro, Epstein, et al. (2015) and Rooksby et al. (2014), MyFitnessPal users were usually self-tracking for a short-term and specific goal. These kinds of goals stand in contrast to the expansive and continuous goal of making self and life transparent and knowable through numbers, as crystallised in the QS tagline – 'self-knowledge through numbers.'

Sometimes the reasons for wanting to lose weight were related to wanting to look better *and* some health concern. Georgina, a gardener in her forties, who had counted calories since her twenties whenever she wanted to lose some weight, explicitly mentioned these two reasons:

It's a combination of things, I've got full hip replacement and femur replacement [...] So I keep my weight down, primarily because of my false hip and femur. And secondary would be image related, you know I like putting my skinny jeans on, and trying to keep, outside work, looking good, looking ok, going out and thinking – yeah, I'm happy with myself tonight.

Though in Georgina's case health referred to a specific medical issue, for many participants who mentioned both health and appearance as motivators, health meant being generally more active and energetic, as well as living a longer, more productive life. This was sometimes associated with children, as stated by Audrey, a financial advisor and a self-confessed lifetime dieter in her forties: 'you've got kids you want to stay around for years, you don't want to pass out and die when you're 50.' Four participants had looked up their respective body mass index (BMI) and geared their weight loss towards it. One of them, Emily, a teacher and a mum of two toddlers, was aiming to lose her 'baby weight' and 'wanted to lose two stone [12.7 kilograms], because again on the internet, the wonderful thing, it said that [the weight was] like a good BMI, middle kind of BMI for my age and height.'

Some participants wanted to lose weight because of a specific health concern. Judy, a forty-seven-year-old manager, was diagnosed with high blood pressure and her doctor told her to either lose weight or go on medications. She successfully achieved her goals – losing weight and lowering her blood pressure – partly thanks to MyFitnessPal, recommended by a colleague, a sports scientist:

Well, I was diagnosed with high blood pressure back in 2013, and I didn't want to go on medication [...] Because the doctor said 16 pounds [7.25 kilograms], exercising 2 to 3 times a week or I'm gonna put you on medication. At this point, I was 45 years old. [...] Contacted sports science colleague, and he starts working with me [...] And at that point he said to me – have you come across MyFitnessPal, erm, I use it, friends use it, give it a go.

Thus, the participants self-tracked to lose weight, to look better and sometimes to improve their health. Even though these goals were associated with self-improvement, they were rather modest, and often not particularly novel, in comparison to the quest to ‘optimise’ diverse aspects of one’s life as depicted by the QS metaphor. In short, the participants’ goals were more specific, temporary, modest and mundane than the expansive, continuous, and novel goals encompassed by the metaphor of QS in the literature.

5.3.2 ORDINARY USE

5.3.2.1 *Trust in data and device*

When getting started with MyFitnessPal, users need to enter their weight and height, their activity level and their weight goal. They also need to state how much they want to lose per week. The app then provides daily calorie and nutrient goals. Although MyFitnessPal allows users to customise these goals by entering their own calorie/nutrient limits, the participants usually followed the calorie and nutrient limit offered by the technology. Similar to self-trackers in the studies by Niva (2015) and Ruckenstein (2014), participants of my study simply thought that this was the way to use it. This is illustrated by Emily, who when asked why she decided that 1400 calories were the right limit, explained ‘Because that’s what it tells me.’

Most participants who simply wanted to lose weight, like Lilian, a 35-year-old school administrator, who lost four 26 kilograms using the app and made friends on its forum, trusted the app and its creators. Lilian described them as ‘the experts because they are the ones that formulated the numbers.’ Similarly, Dom, a 40-year-old teacher, who lost around 38 kilograms using MyFitnessPal, explained:

[I]t was all app-driven, I made no personal decisions to change, and I figure, you know, basically I’ve put the trust in the app, I kind of decided

that the people who made it know much more about health and kind of like diet then I do, if they're telling me then you know. And it's got thousands and thousands of users, hundreds and hundreds of thousands of users, so you know.

Some participants tinkered with the calorie/nutrient limits. These were usually either personal trainers (who would suggest to their clients how many calories they should consume based on their own calculations) or the more physically active weight loss pursuers. However, participants did not find the adjustment of the nutrient goal straightforward. As Freddie, a gym manager and ardent bodybuilder, who used MyFitnessPal to get leaner before his annual photo shoot, recounted:

When it was making my goals, it was making my protein too low, and I knew it was too low. But I didn't know where to go with it, because I didn't know enough about it and I kind of got a bit frustrated.

Thus, for many of participants of this study, the app was treated as an authoritative tool, providing them with a figure of how many calories they should be eating to achieve their weight goal. Participants did not question these numerical targets and did not look for an alternative, maybe more personalised, number. The QS metaphor speaks of how self-trackers 'use their bodies and the cultural resources around them to see outside the frame that devices set for them' (Nafus & Sherman, 2014, p. 1793) and aim to find personally useful measurements (Neff & Nafus, 2015; Sharon & Zandbergen, 2016). In contrast, participants of this study expected the app to provide them with a straightforward calorie/nutrient limit to help them lose weight. Whilst few of them were aware that individual calorie needs were dependent on the body's metabolism, they did not seek to personalise the calorie limit.

5.3.2.2 *Basic use*

In contrast with other self-tracking tools or apps, which automatically log the data (e.g., how many steps you have taken), MyFitnessPal requires users to manually log the items they eat and drink. Nevertheless, MyFitnessPal offers various features to help with this process: there is a large database from which participants can select items (if items are not already in the database, participants must manually enter information). There is also the possibility to use a barcode scanner to read the calories from packaged foods.

Generally, participants found MyFitnessPal easy to use. Alex, an undergraduate student in his late twenties, said that ‘it was easy and understandable, easy to sort of pick up, yeah everything is pretty self-explanatory really,’ reflecting the general tone of evaluations. However, finding the app easy did not mean that participants were familiar with, or keen to use all its features. Participants usually were like Ruth, a 31-year-old lecturer and sporadic MyFitnessPal user, who ‘didn’t even realise [recipe importing from the internet] was up there,’ though when told about the function thought it was ‘amazing.’ The barcode scanner was praised by some participants as the quickest and most precise way of logging food in MyFitnessPal. Others did not know about it. One of them, Audrey, who ‘had [the app] for ages’ and was always searching for foods in the database – the first option that app displays – was surprised when asked if she used the scanner: ‘I wasn’t aware of that, is it like a barcode scanner on your phone?’. Another participant, Freddie, also confessed that until his friend showed the barcode scanner to him, he did not know that there was one, although he had been using the app for a long time:

because it doesn’t really tell you in the app that it’s got that, it’s just the tiny little icon of the barcode at the top and you’re like, if [...] you’re new

to the app, unless you sit and go through all different icons at the bottom, you go – oh, hang on a minute.

While Freddie and Audrey were not using the barcode scanner because they did not know about it, others did not use it because it required too much skill to master. Eve, a nurse advisor in her fifties, was recommended the app by her colleague, who used to scan food in the common room at work, and explained:

Q: But you said you didn't use the scanner? Or did you?

Eve: No, I wasn't, no I didn't use the scanner to scan food, the packing. I wasn't quite sure how you did that, so.

Q: But you knew there was a scanner, because your manager...

Eve: He told me about that, I think he used to get a bit frustrated with it.

The thing is when I retire I'm gonna go to a computer course, a bit later.

A similar apologetic tone about technological competence is echoed by Judy:

I input manually, yeah. I'm not technically particularly brilliant, to be honest. So, I've always, erm, every time I have a meal, erm, I go into the app and erm so I go to my diary and I input.

Instead of trying to figure out how to manage the barcode scanner and make their food logging quicker, Eve and Judy continued to log food manually, searching the database. For them learning to use the barcode scanner was seen to require more effort than the daily manual input.

The participants' stories reveal that they often used the technology in a basic way, sometimes not knowing about, or struggling with, more advanced features. This is in line with other studies, which have shown how older adults struggle with using self-monitoring

technologies and want more instructions (Mercer et al., 2016). The present study illustrates that also early mid-lifers, who have chosen to self-track, may find the devices complicated and end up using them in a basic way. This confirms findings in human-computer interaction (HCI) that people rarely know all features of even the most common technologies, such as software (McGrenere & Moore, 2000) or household appliances (Blackler, Gomez, Popovic, & Thompson, 2016). However, this use of technologies stands in contrast to the image of self-tracking drawn by the QS metaphor, where self-trackers are enthusiastic about the possibilities of technologies and keen to adapt or modify them to fit their needs (Choe et al., 2014; Lee, 2014). The everyday calorie trackers I interviewed appreciated simple, easy to use technology. Rather than modifying the technology and to explore its more advanced features, they stuck to the basic features and trusted the information provided.

5.3.2.3 Prospective tracking

Self-tracking tools usually provide users with information or data on what they did in the past day, week, month, or even year. The possibility of using these data to retrospectively track trends in one's life has attracted attention in the literature on self-tracking. The participants of the present study, however, rarely engaged in 'looking back.'

MyFitnessPal provides ample opportunity for observing your progress through time. Users could check how their weight had changed or how well they kept to the calorie and nutrient goals throughout the day or within a week. Some users found the historical logs motivating, especially during times when the weight loss was not going according to the plan. For example, Serge, who became enthusiastic about nutrition and sports during his MyFitnessPal use, said:

I think I used the, to stay motivated to plan, I used the graphs of your weight-loss over time and just saw how that graph was always going down, so on the occasional week when it gone up, I'd go – ok, well it's gone up this week that's fine, I just need to get back on it.

But overall the graphs were rarely looked at and not valued. Some participants, like Wilma, a police officer in her forties who wanted to lose weight to be able to fit into her older clothes, saw no point in looking back:

I don't look back, but I know that I had two bad days, you know, I don't scroll through it and go oh, I had you know, 3000 over, I don't look back but in my mind, I know that on two days I probably been really bad.

Other participants were more concentrated on the app's estimation of the weight in the future, i.e., in a few weeks' time. For example, Vijay, a postgraduate student who learned by using MyFitnessPal that eating biscuits interfered with his weight loss, stated:

Oh no, I don't look at [historical data], most I look when it says at the end of the day to complete the entry, that's the one I click because it gives you what you would be in the next four weeks [...] It makes me feel good, it's just about it.

The QS metaphor suggests an image of self-trackers as engaging in 'long-term reflection' through data (Li et al., 2010): looking and analysing the accumulated data, aiming to spot trends or correlations and finding explanations for behaviours or changes. When asked to look at the extracts of food diaries the participants of the present study often did engage in 'data-work' (Elsden et al., 2015), i.e., they explained their food choices and described the background for their choices. However, as the quotes show, looking back at their past data was not something they normally did. It seems that the past for the participants was more a

point of departure, something to get *away* from, rather than something to be looked at and analysed (especially in cases such as Wilma, when participants knew that they had ‘been really bad’). It was the future, and the anticipated changes, that participants focused on. This prospective rather than retrospective attitude is similar to the findings of Rooksby et al. (2014, p. 1171), who argued that ‘[t]racking is often about where you are heading in life.’

5.3.3 ORDINARY EFFECT

As hinted in the previous section, self-tracking technologies offer the opportunity – and for some, the hope – of changes in behaviour, possibly helping to lead healthier lives. Talking to the participants it became clear that using MFP *did* lead to some changes in both their behaviour and awareness. However, again, these changes were rather modest and often temporary. They mainly related to perceiving food items differently, but did not involve any fundamental and continuous changes, or form the basis of the creation of a new self, as suggested in the QS metaphor on self-tracking.

Through notifications about nutrients and its blog MyFitnessPal aspires to ‘nudge’ users to make ‘healthier’ decisions about food. But because participants mainly wanted to lose weight, they typically used MyFitnessPal only as a calorie counter. Therefore, the changes inspired by MyFitnessPal had to do with participants’ perception of food, in particular, making them think about food items in terms of calories. This new way of looking at food was sometimes surprising and revelatory, like when Eve found how calorific chocolates were:

Yeah, it makes you realise how many calories there are in [sweets] ...

[s]omebody had brought some Celebrations, and I think 6 celebrations will

add up to 300-400 calories. I had no idea, that sort of these little chocolates could be so much. I was – oh my god!

Being surprised by the data collected by self-tracking has been documented in other studies as well (Ruckenstein, 2014), and it shows that the use of MyFitnessPal did change the perception and awareness of the participants. The need to track food and count calories made participants, in Audrey's words, 'really really mindful of what you're eating during the day, rather than just eating whatever sort of goes past you.' Another participant, Dom, noted that the need to log your food made you see how the calories of a chosen food can add to the daily calorie count. For Dom, this constituted 'a breakpoint [...] a point between you and eating.'

This new awareness made some participants rethink their choices. As Lilian explained, after a while these changes became 'internalised', i.e., participants remembered 'which foods are the best ones to eat and which ones are your treat foods really.' So similarly to photo-based food journalers (Cordeiro, Bales, et al., 2015), participants not only learned to re-evaluate the foods based on their caloric and nutritional value but also became generally more aware of what they were eating. This confirms the health research argument that self-monitoring helps people become more aware of the practice that is being monitored (Wilde & Garvin, 2007).

However, when asked whether using MyFitnessPal had an effect on what they thought about *themselves*, participants either disagreed or only talked about their changed perception of food. This is illustrated by Amy, a project officer and avid gym goer in her thirties, who only found MyFitnessPal as a source of information about food:

No. I don't think it has changed the way I think about myself. Well, maybe, I know I'm doing the right thing, and I know I have a lot of knowledge, that it's already provided me with.

Thus, while the use of MyFitnessPal resulted in new knowledge about calorie values of foods, it did not entail (better) knowledge of the self as the QS metaphor implies (Nafus & Sherman, 2014; Ruckenstein & Pantzar, 2015). The everyday calorie trackers learned about calories, but did not engage in the creation of a new self (Lupton, 2013a, 2013d; Swan, 2013).

The QS metaphor depicts self-tracking as a life-long activity, a lifestyle (Choe et al., 2014; Schüll, 2016). However, for many everyday calorie trackers, MyFitnessPal was simply a tool to be used over a short period. As Justine explained, for her MyFitnessPal was 'a tool that helps me if I need a change, if I need to lose a bit of weight, I know that there's a tool that I can turn to.' In other words, the everyday calorie trackers usually engaged in self-tracking sporadically, when they felt unhappy about their weight. Many of them *did* lose some weight as planned. As a consequence, they would often stop using MyFitnessPal and therefore regain their weight, which in turn prompted them to return to use MyFitnessPal again. The reason for gaining weight, after stopping to use MyFitnessPal, was not that the participants forgot what they learned about food using MyFitnessPal, but because they stopped controlling their diet. This is illustrated by Joe, an IT technician in his late forties, who aimed to lose weight and build muscle:

I was made aware of what I was actually eating, I was able to maintain, you know that diet. [...] But when you're not using the app, it's a lot easier to start eating stuff that has quite high calorific content.

Thus, for the everyday calorie counters, self-tracking did not become a new way of living. The effects of using MyFitnessPal were limited both in its scope (influenced some of the food choices and helped to lose some weight) and duration (influence was connected to the continuous use of the app). These limited and temporary effects offer a counter-point to the expansive effects in terms of changing one's self and future on a long-term basis, characteristic of the picture drawn by the metaphor of QS in the literature.

5.4 Conclusion

Ruckenstein and Pantzar suggested that the QS metaphor should not define self-quantification, but be a point of departure for a further examination of actual practices, noting that 'epistemological claims advanced as formative for the data-driven paradigm should be rethought as epistemological inquiries' (2015, p. 12). In this article, I have followed their suggestion as well as earlier research on Internet and health (Henwood et al., 2003; Nettleton, Burrows, & O'Malley, 2005; Wyatt, 2003) and have deliberately attended to the experiences of ordinary or everyday users, who may engage with the technology in a way that does not conform to hype. The shift is necessary because, as the present study showed, the focus only on those actively engaging with new technologies skews the vision of the technology, its use and users, and fosters unwarranted expectations and visions.

Metaphors not only help us to talk about technology, but as Wyatt (2004: 257) notes, metaphors form visions and perceptions of technology and can 'shape the future.'

Ruckenstein and Pantzar (2015) note how the QS metaphor in *Wired* partakes in the generation of a data-driven technology market. The components of the metaphor illustrate the contradictory features of the Californian or Silicon Valley high tech discourse, professed by *Wired*, combining elements of sixties counterculture and hardened

entrepreneurialism (Barbrook & Cameron, 1996). So, the idea of continuous optimisation of one's self and performance harks back to individualistic entrepreneurialism and the notion of biohacking to the romantic ideas of hackers as emblematic of countercultural sharing and creativity, as articulated by, for example, Himanen (2001).

In contrast with the QS metaphor's portrayal of self-tracking as imaginative biohacking, the everyday calorie trackers used the app at a basic level and were keen to trust and be guided by the data and information provided by it. The QS metaphor also emphasises long-term changes, such as self-tracking adding to self-knowledge and continuous enhancement of health and performance. In contrast, the changes induced by MyFitnessPal to the everyday calorie trackers were targeted and had limited scope and duration.

Everyday calorie trackers can be seen as less active in their tracking than QS trackers, but they are also less self-disciplining as they focus solely on tracking calories here and now. Hence, I suggest that the features of self-tracking's image as indicated by the QS metaphor are exaggerated when compared to real-life self-tracking practices, both in the positive sense of creative use and in the negative sense of relentless disciplining or optimising all areas of life.

Based on the findings, I argue that a new picture of self-tracking emerges. Instead of the image of individuals actively transforming and personalising technologies (as portrayed by the QS metaphor), I see individuals using a new technology in a rather limited and less enthusiastic manner. Secondly, rather than self-tracking resulting in a *fundamental* change in terms of how people see themselves, leading to the creation of a new self, for the everyday calorie trackers, the use of MyFitnessPal resulted in temporary and very specific *incremental* change. None of this is to deny that self-tracking does not affect the way I perceive and take care of our lives. Ultimately it continues the trends of quantification (Porter, 1995) and promotion of self-care. However, the findings suggest that these trends

are likely to be less expansive and profound in the everyday use of self-tracking technologies than indicated by the QS metaphor.

CHAPTER 6

DOING CALORIES: THE PRACTICES OF DIETING USING CALORIE COUNTING APP MYFITNESSPAL

6.1 Introduction

Fat, perceptions of it and ways of tackling it are popular topics addressed by diverse disciplines. Studies have looked at social and moral evaluation of fat as well as experiences of those engaged in weight loss. Historical studies have outlined how corpulence became a social problem from the 19th century onwards (Schwartz, 1986). Today this vilification continues with ‘war on obesity’ fought by governments and medical professionals (Gard & Wright, 2005). Researchers have discussed the different moral evaluations associated with fatness and thinness, such as body/mind, lack of control/self-control and gluttony and greed/restraint (Bordo, 1993; Gilman, 2010). Likewise, it has been shown that eating and food have for a long time been morally evaluated (Coveney, 2006), to the point that today we think that people’s morality might be judged by the food they eat (Steim & Nemeroff, 1995). Researchers have looked at the representation of fat people in the media and shown that the portrayals are mainly negative (Contois, 2013; Plotz, 2013). Consequently, with all the negativity attached to ‘excessive’ eating and fatness, pressures to control eating habits and get thinner coming from governments and media, many resort to dieting and other means of weight loss. Studies have explored the experiences of such endeavours by exploring diet groups such as Weight Watchers (Heyes, 2006; Stinson, 2001), online dieting (Niva, 2015) and surgical weight management (Throsby, 2008).

We thus have some knowledge about attitudes towards fatness, the role of the media in changing and sustaining these attitudes, and the feelings and opinions of those engaged in dieting. In short, researchers have focused on what people *think, feel, and know* about body weight, calories and dieting. However, despite the interest in fatness and pursuits of weight loss, the practices of dieting, what people *actually do* when they wish to lose fat and otherwise manage their weight have been little explored. In this chapter, I aim to fill this gap by exploring the ‘doings’ of calorie counting – what actions and considerations are required of those engaged in calorie counting. This attempt is guided by the practice-oriented traditions of science and technology studies (STS) that emphasise the importance of mundane, often overlooked practices.

Researchers working in STS have highlighted the importance of observing the everyday practices of scientists (Latour & Woolgar, 1979) as well as users of technology (Oudshoorn & Pinch, 2003). This is essential for noting the efforts required to establish a fact, in case of scientists, or to adopt a technology. This ‘invisible work [...] outside formal work relations’ (Oudshoorn, 2008, p. 275) is, thus, the focus of this chapter. I explore what using MyFitnessPal requires its users to *do* to count the calories they consume successfully. In particular, I explore three practical aspects that constitute calorie counting with MyFitnessPal. Practical temporality – the importance of time of calorie logging, practical precision – the need to measure and weigh food items to know their calorie value, and practical adjustment – the endeavours to combine calorie counting with ‘excessive’ eating that results from socialising. I highlight three findings that emerge from analysing these three practical aspects of calorie counting. First, I show that each of these aspects required efforts from MyFitnessPal users if they wished to establish a correct calorie count, and these efforts, in turn, affected users’ eating habits. Second, the efforts exerted by each user were different as their diligence and commitment to precision could

be seen in a continuum, suggesting that there was no unified approach to calorie counting. Lastly, despite the constraints imposed by calorie counting, users also negotiated their use and adopted MyFitnessPal to suit their lives.

6.2 Exploring practices of eating and dieting

While perceptions and experiences of eating and dieting attracted significant attention, the same cannot be said about their practices. Comber et al. (2013) investigated food practices, exploring how the practices of buying, preparing and eating food are managed. These practices are affected by time (time available to shop, cook, eat, and the time available food stays fresh) and people (children and guests influence what food family eats). Comber et al. (2013) showed that people do not have precise meal plans and follow routines for both buying and preparing food. Participants recognised that ready-meals are less nutritious and ‘healthy’ but still ate them as they were time-saving. Eating out was providing freedom to think more about taste than healthiness of the food. Similarly, Kerr et al. (2014) researched practices of food preparation to understand cooking needs. They too found that people do not plan meals much and usually buy similar foods. People usually weigh ingredients only when they bake. While food is usually cooked alone, social elements such as advice, sharing and feedback influence the process.

Food practices related to dieting have been explored by De la Rocha (1985, 1986), who has looked at everyday food measuring and counting practices evoked and guided by participation in Weight Watchers weight loss group. She interviewed and observed measuring practices of ten females participating in the Weight Watchers program. At the time, Weight Watchers required dieters to consume a certain number of portions of different foods during a week. All foods were allowed as long as the amount that was eaten followed the recommendation. Hence, weight-watchers needed to engage in a lot of

measuring. De la Rocha notes that based on their approach to dieting, there were two groups of dieters – the meticulous controllers of food intake and others who relied on previous dieting experiences and generally tried to eat very little and used Weight Watchers program only as a rough guide. De la Rocha's (1986) focus was not so primarily on dieting, but on 'everyday arithmetic'. Thus, she focused on participants' practical ways of measuring food without employing scales or measuring cups. For example, they would measure once the amount of food that is considered as a portion by Weight Watchers and, for example, note a decorative marking on the dish to which the food is filled, so that next time they could use this as a reference for the required quantity.

Relating to these insights on food preparation and consumption practices as well as on investigation of Weight Watchers practices, I will explore what practices calorie counting with MyFitnessPal required and how its users negotiated these needs. This endeavour is guided not only by STS analytical focus on practices but also by its evaluation of technology and quantification.

6.3 Understanding practices of dieting through STS perspective

To unpack and understand the practices and implications of everyday usage of weight loss technology, I adopt an STS perspective of technology and quantification. STS researchers argue that numbers used by various tools are not stable, already-existing entities, but rather are produced through commensuration and measurement, which change 'qualities into quantities', and this change 'creates new things and new relations among things' (W. N. Espeland & Stevens, 2008, p. 412). Martin and Lynch (2009), for example, show that counting chromosomes and people is not a matter of simply ascribing a number to quantity but rather involves negotiations of practicalities to, first of all, make those things

countable. Following this approach, I wanted to explore and highlight how people used MyFitnessPal as a dieting technology, and how they made the food and calories countable in their daily practices of food planning, preparation and eating.

STS researchers have shown how standards and classifications, such as BMI and calorie counting, affect the people and practices they classify (Timmermans & Epstein, 2010). For example, Dumit and de Laet (2014, p. 77) discuss how calorie, itself a product of ‘instruments, infrastructures, and negotiations’, comes to define ‘women’ and ‘men’ through nutritional guidelines of calorie consumption. Bowker et al. (1996) show how nursing standards are constructed to define what nurses do, how they do it and therefore what nursing is. In a similar fashion, I wanted to see what, if anything, employing standardisation and classification of food in calorie counting ‘does’ to eating, dieting and the people involved.

In what follows I present the results of the exploration of practices of dieting from STS perspective. I show that, even though calorie counting was ostensibly ‘automated’ in that users did not need to count, i.e. add and subtract the numbers of calories, they still needed to put a lot of effort to transform the foods they ate into numbers of calories. Moreover, calorie counting was pervaded by moral undertones, which influence what was counted and how.

6.4 How calorie counting is done

6.4.1 PRACTICAL TEMPORALITY

One of the first things one has to decide when using MyFitnessPal is *when* to log the food eaten. There is no prescribed time of doing it, and thus users can decide whether they log before, during or after eating. These choices have their different advantages and

disadvantages that are connected to individual routines and aim for the precision of the food log. Logging long after a meal indicates that users were seeking convenient use, rather than a 'perfect' one. On the other hand, decision when to log can also influence eating habits. Logging during meals disturbs the eating habits as cooking or eating are being interrupted to enter the food into MyFitnessPal. Logging in advance highlights the reactivity of calorie counting as measurement (W. N. Espeland & Sauder, 2007) – instead of counting the calories they consume, participants are planning their meals and adjusting them according to the calories suggested by the app. This not only affects participants' eating behaviours requiring them to be regulated in advance but also changes the calorie counting as measurement

In general, logging food for calorie counting could be quite time-consuming and needed to fit in sometimes very busy schedules. So most often participants would log food when they had some free time, like during their breaks at work:

Eve: I mean I had my breakfast at home, and then I get to work I put in while I'm having a coffee, before the morning meeting, then after lunch, I put it in, then after dinner I put it in.

Similarly, some logged at the end of the day, after work and dinner, when they had more free time to sit down, remember and log all the things eaten:

Lilian: It can be time-costly [...] I tend to do when [...] my son's gone to bed because you can just sit there and work it all out, but you do have to have the patience.

Moreover, some participants knew that logging 'long after' a meal may be problematic and were explicit about avoiding logging foods only at the end of the day because it made it easy to forget what was eaten:

Samantha: I think if I remember I'd put it in after I've eaten the food, I think if you tried to at the end of the day you'd forget half the things you've eaten. I used to do food diary when I was training as a swimmer, *so I was aware that if you did it at the end, you forget everything*. [my emphasis]

Samantha echoes the nutrition scientists who use food diaries and note that participants forgetting and therefore not logging eaten foods is a frequent issue (e.g. Macdiarmid & Blundell 1998). This concern was mentioned by some other participants as they underlined the importance of timing for the 'reliability' of their records.

In addition to issues of remembering, counting calories at the end of the day or long after the food was eaten was seen as posing a risk of going above the calorie norm, because you would lose the possibility of reflecting on what you are eating prior or during consumption:

Alex: I would tend to be putting in food kind of afterwards. So, you'd have Subway, when I've been out, I'd grab a subway or something, out in town, and then an hour later you come to put it in and see that that was about 800 calories – bloody hell, didn't know that.

So, not logging before a meal could lead to unpleasant surprise and possibly going over the calorie limit. Yet as the earlier quotes show, a lot of participants were logging long after eating despite the potential of 'unreliable' data. This indicates that often convenient use that fits with own life is more important than 'perfect' use that generates 'reliable' insights.

Some participants addressed the problem of 'reliability' by logging *while* eating or cooking, so there was less chance of forgetting:

Julie: Usually [...] I put my breakfast in as I'm eating my lunch [laughs].

But then tea, I would put it while everything is cooking, I know I've got it ready, and it's fresh in my mind if I do forget.

Logging foods while cooking was also helpful as participants could weigh and search for the ingredients or meals straight away:

Gemma: I'd probably enter it while I was cooking and then mend it, say if I haven't eaten it all, I'd mend it afterwards, but I would put it in while I was cooking so that I knew exactly what was in there.

Logging while cooking helped to make the log more accurate and precise. Yet logging while cooking inevitably interrupted the eating or cooking, and made participants focus on the calorie values of food. This is one of the ways in which calorie counting affected the eating habits.

Others were even more determined to get the numbers right and to be in control and, therefore, counted calories *before* eating, often logging in the morning all the items they were going to eat during the day:

Georgina: And then either I see what calories I've got left for dinner, or I know what I'm having, and I put that as well. So, I do it, I do it as much as I can first thing, so kind of like *you know what you can have the rest of the day*.

In addition to safeguarding from going above calorie limit, logging in advance enabled participants to determine if any other food in addition to the planned meals could be consumed. And for sport's enthusiasts, like Barney, logging in advance also helped to ensure that all the required nutrients will be consumed:

Barney: Sometimes I know what I'm going to eat for the day, and I might just put it all in at once [...] for example, yesterday evening I was going to have sweet potato with steak, I put in the steak, I put in the sweet potatoes, I will look on MyFitnessPal – oh, that's, if I was like I said [...] I want a hundred grams [of] sweet potato, I realise that's not really enough, so I can use it to add, *use MyFitnessPal to sort of help me prepare my meal*. [my emphasis]

Georgina's and Barney's quotes point to the reactivity (W. N. Espeland & Sauder, 2007) of calorie counting. Participants were not just making a record of their food as they ate, but aimed to regulate their eating by planning and counting calories in advance. Hence, counting calories with MyFitnessPal as other kinds of self-tracking has a prospective character (Rooksby et al. 2014).

The quotes confirm the STS argument that measuring is never neutral or passive, but rather *performative* since it can 'cause people to think and act differently' (W. N. Espeland & Stevens, 2008, p. 412). Participants were not just *tracking* their calories but *regulating* their eating according to them. Timing of logging not only reflected on the precision of food logs but also had an influence on the eating habits and routines of the participants. Exploring the timing of calorie logging not only reveals the practical considerations that need to be taken when deciding *when* to log but also shows different ways that calorie counting influences eating practices.

6.4.2 PRACTICAL PRECISION

Measuring food intake is not straightforward. Apples, for example, come in different types and sizes, and to get a correct calorie count for the eaten apple one needs to find the exact type, its size or, if being more precise, its weight. This gets even more complicated when

eating meals that have many different ingredients. To make food measurement practical, food and calories have to be *constituted* (Potter, Wetherell, & Chitty, 1991) as countable through practical negotiations. The participants of the present study were not scientists wanting to know exactly how many calories each and every item they ate had. They usually wanted to know ‘roughly’ how much they were eating and therefore adopted appropriate attitudes to their calorie counting. As Gemma put it: ‘I mean you’re never going to get this exact calorie, I don’t think. But as long as you’ve got an educated guess as to what you’re eating, I think it works very well.’

Participants’ stories reveal different ways they achieved the desired precision, which indicate that attitudes to precision range on a continuum from approximations to very precise counting. Hence, the calorie count – a number that appears to be exact and objective – is actually approximate and arrived at in messy and individual ways. Whether measured by grams or approximated by handfuls, food became estimated in a more constricting manner, requiring attention to the quantities that participants possibly had not given before calorie counting.

Some of the participants did not measure but rather guessed the weight of their food items. Some, like Vijay, did not weigh food because they did not have kitchen scales. Others, simply thought that weighing food in addition to logging it would have been too bothersome and, as Joe, they could not do the food logging if it had required that much:

Joe: I wouldn’t [weigh Ready Brek out], no I don’t go to that length. A Hundred millilitres is very very little. I wouldn’t go to the extent of actually weighing or measuring it out. Cause I think if I did that, I don’t think I would be able to maintain.

These participants argued that measuring resulted only in small inaccuracies (especially of less calorific foods), and did not affect the overall calorie count much. Therefore, it was not essential to measure precisely.

In a similar vein, some participants who were reluctant to measure food argued that the imprecisions would average out over time:

Stacey: I just put in twenty [grapes], I could weigh them up, but I never do that, just make my lunch and just eat twenty, I sort of go on, some days, some weeks they'll be really big, and I probably wouldn't be putting enough in, but other weeks they probably be a lot smaller, so I guess over the year I average out.

Stacey was aware that the way she logged grapes was not accurate, especially in relation to the daily calorie goal. However, she thought that this did not affect her weight loss as the different weights averaged out throughout the year. Thus, the participants were not so much interested in keeping a precise 'daily record', but more in having an aggregate log that would help them control their weight.

Some participants, similarly to those in de la Rocha (1986) study, found practical ways of gaining at least some precision without overburdening themselves with constant weighing. One method was *once* measuring the foods eaten often and then using that as a template for the future:

Gemma: So, I'd always, if it's something new I'd always measure it first, first time I used it, and then afterwards just try and remember what it was that I had last time.

Anamaria: But then I was, because we bought a really small kitchen scale, I weigh, I used it once to weigh like a pear once, to weigh an apple once and I'm just using that.

Those who used the app more frequently or were familiar with calorie counting often learned to estimate weight from the size or volume of a food item:

Georgina: And I know these measurements, I used to put my bowl on a set of scales and zero it and measure, and now I know I have a scoop, how many spoonfuls that makes, and the blueberries is well under 100 grams.

These techniques were helpful, as most participants said they routinely ate the same food items. By using such methods, participants established a middle ground, as they avoided both just guessing the weight of their food or/and constantly measuring it, and instead created ways of approximation.

To help with precision, MyFitnessPal has a scanner so that users can scan the barcodes of packed foods straight into the app, which reads their calorie content. However, often the food that participants ate neither had a barcode nor could be found the database. Hence, participants encountered a special difficulty of recording eating (and being precise) if they could not find items in the database. In those cases, they might have to 'guess' what would be a *similar* item:

Lilian: And half the time it's there, but if it isn't there I would just look for the best fit, so even if it's not a complete precise, there's an estimate, I choose the most, the nearest thing, you know what I mean.

Likewise, when eating out in a restaurant, which did not have its menu on MyFitnessPal, participants would think of establishments that have a similar menu and were available on the app:

Roy: So, if I'd been out, I don't know, if I'd been to Franky and Benny's or something, where there was a Harvester equivalent, and you kind of think - 'well I've been to both of those places, they're roughly about the same amount'. I would pick the one that's in MyFitnessPal, rather than just try and build something. So yeah, I'd pick, I try to find whatever was the most sensible comparison that I could go for and pick that.

With complex items, i.e., those that consisted of several ingredients, this would involve more complex 'guesswork':

Q: So, but then I imagine, if you put like a roast dinner plate, it probably has something like from 400 to 1000 calories. So how did you choose between?

Georgina: Well I knew I had cauliflower cheese, I knew how many roast potatoes I had, and whether they were cooked in fat. Cause I've been observing for so long, I suppose I had an idea, I knew that plate of dinner wasn't 400, and I fill in the wrong thing just to kid myself. You know, I know there's a temptation to put in 400 and think oh, I've got another 800 to go, but I err on the side of going too much, rather than too few calories.

Hence, in calorie counting as in other counting practices, to count at least approximately right, the user needs to *know* what they are counting, and be aware which numbers are wrong (Martin & Lynch, 2009). These quotes show that engagement in measuring of calories for a long time enabled participants to estimate them based on prior experience. Thus, calories become integrated into their eating practices – they can 'guess' calories based on prior experience.

Despite recognising that calorie counting *as measuring* could not be very precise, a few participants wanted at least to do their part ‘right’ – they aimed to be precise and weighed everything they were eating. For many, this was done to get the ‘correct’ portion as defined by the app or food package. Alex explained how the meaning of the ‘correct’ amount of food changed when he was dieting:

Well because, maybe because I was using it on sort of weight loss aim, was always kind of choosing to go for sort of portion size that it says on the packet, rather than just pouring until you reckon that’s about right, so yeah it would be sort of 50 gram, whatever would be just poured out, I could probably because it was 50 gram, it’s not because it’s the amount that I wanted or anything like that, or because it was the amount that I need to, to the target, sort of, if I was able to sort of meet the target by going to 35 grams or something.

When Alex was tracking his diet, the portion size was regulated by the weight loss aim, rather than by a whim, as it was when he was not tracking. Hence, because he was aiming to lose weight, he needed to eat the ‘right’ portion and, therefore, measure the ‘correct’ amount. Similarly, Barney explained that it was easy to get the weight and portion wrong by just estimating:

And like if I was, like I was weighing out fruit or something, you don’t quite get an appreciation like, 80 grams you can actually get it quite wrong, you don’t realise how wrong you can get it, so [weighing] is useful.

So, measuring was presented as a way to get the ‘right’ amount and as an opposition to ill-informed guessing, where it was easy to not ‘realise how wrong you can get it’ and

damage your weight loss. Hence, precise logging of food with MyFitnessPal affected what participants perceived as a portion, and consequently their eating practices.

Power (2004, p. 769) argues that we expect measurement to 'not to depend on who is doing it' and therefore be replicable. However, as the discussed examples show such expectations are hard to meet when it comes to calorie counting. Different users approach measurement differently, depending on their perception of the effect precision can have on their weight loss. There seemed to be no unified way of how food logging for calorie counting should be done. All the examples above illustrate the continuum of approaches to the precision of calorie counting. The stories signal the messiness of the ways the precision was being achieved and the subjective side of the calorie values. At the same time, they illustrate how different attitudes influence eating habits by redefining the meaning of measures and quantities of food.

6.4.3 PRACTICAL ADJUSTMENTS

Participants often had a routine diet that they established as fitting under their calorie limit. However, as for dieters in Niva's (2015) study, events, such as socialising, would make participants deviate from the routine and eat more calorific meals. These were referred to by some as 'cheat' or 'treat' meals, highlighting that food consumption was fraught with complex social evaluations associated with doing the wrong thing or rewarding oneself (Coveney, 2006; Lupton, 1996).

Calorie counting added another dimension to these evaluations as participants not only morally evaluated these actions but also had to deal with the 'excess' consumption practically. While some participants aimed to minimise the influence of 'excess' consumption to the calorie limit by eating less beforehand, others would stop counting calories altogether if they anticipated the 'excess'. MyFitnessPal thus was not a tool to

keep a perfect record of calorie consumption, but rather an aide to help lose weight.

Manipulation of the app's use indicates that despite the rigidity MyFitnessPal required in order to achieve weight loss goals, its use had to fit the users' lives.

Some participants, especially the sports enthusiasts, would actively avoid going over the calorie limit. If they wanted to abandon the planned diet and eat something more calorific, they would try to build a calorie deficit either eating less during the week before or on the day. To do this, they would need to engage in the earlier mentioned planning of meals, so that they could compensate their 'cheat' or 'treat' meal by being more austere in advance. This kind of 'allowance', especially the weekly one, is not in any way encouraged or supported by the app, so participants came up with this idea themselves and needed to keep these 'saved' calories in mind. For example, Freddie, who was engaged in body building and aimed to get leaner before his annual photoshoot, would calculate the calorie and nutrient allowance he needs to 'save up' in advance and which meals to cut those calories out before going out:

[...] that meals gonna be a thousand calories, those 1000 calories need to come out of somewhere, ok how can you use 200 calories out of my evening meal, or 400 calories, so that's 600 calories I need to find elsewhere in the week, to make sure I hit under.

Similar strategies were used by participants, who only wanted to lose weight:

Lilian: Something that was gonna take my calories, say in the evening meal, went out to the pub for dinner, then I make sure that in the mornings I was eating, I don't know a little bit of fruit for breakfast or you know, yoghurt, or you know, something smaller.

The preparation for an ‘excess’ meal for participants like Lilian were not as elaborate as Freddie’s as they would simply try to eat less before going out for a meal. Yet this confirms the argument made earlier that calorie tracking is prospective, as people anticipated ‘excess’ calories.

Participants often talked about these negotiations, reflections and preparations in moral undertones, describing the eating out occasions as ‘naughty’, which highlights the way in which the moral understandings of consuming excess food and the use of the app supported each other:

Q: But then, as you mentioned now, so if you go for a meal or have a birthday or something like that, do you try then to cut out calories before, you know, by exercising or by eating less?

Eve: Yes, I would do. I would probably eat less, I would sort of try and make sensible choices.

Q: So, like an allowance for you to...

Eve: Be a bit naughty. Yeah.

And similarly, the participants referred to the austere regimes adhered to prior to eating out or more, as being ‘good’:

Stephen: If I knew that meal was coming up, I would try and be good that week, I try and be good the week afterwards, be better than I would normally [...] I wasn’t too hard on myself, I can see how people could be hard on their selves on this, it could make people paranoid, erm, and I felt like I was probably getting a bit that way towards the end.

Coveney (2006) argues that nutrition provides an ethical framework through which to construct ourselves as certain kind of persons. Therefore, there seemed to be a moral

difference between strict and regulated diet ('be good') and the occasional meal out ('be a bit naughty'). This echoes the religious language used by the weight loss industry (Contois, 2015) and commercial weight loss groups (Bacon, 2015), with 'good' and 'bad' foods constituting sin or salvation. However, Stephen recognised that it was easy to get 'paranoid' when logging food for calorie counting, suggesting that too much strictness was not welcomed. This goes in hand with Crawford's (1984) findings that people find both control and release essential for health.

Another way of dealing with 'excess' is by stopping calorie tracking altogether. For example, Ruth would stop logging if a breach of calorie limit could be anticipated:

No. Erm. When I first started, when I was kind of enthusiastic about it and I was trying to lose weight for a holiday for the summer, and I then was quite good about making sure that I'm putting everything in every day, but even then, still at the weekends if I had more than one glass of wine, I was like – there's no point of putting it in, cause I'll just be well over. Erm. I always log my exercise cause that makes me feel better, but I don't always log, if I know that I had a day where I went over, sometimes I just won't, won't put it in.

This illustrates the way in which excess calories are manipulated out of existence by not logging them in. Ruth told that initially she was 'good' and logged everything, but over time she learned to be more selective in accordance to what made her feel 'better'.

Georgina too omitted weekends when the consumed wine will tip over the calorie limit:

Georgina: [...] it's a day like a Saturday, and I'm out, and I'm drinking lots of glasses of wine, I won't even bother that day, I just think I can't even think about [logging food on MyFitnessPal]. And I know it's about 4000

calories today, so. I don't bother putting that in because it doesn't, I can't see any gains in putting that in. I know I've gone over [the calorie limit], MyFitnessPal doesn't do anything to make me think – 'I might as well fill in 4000 calories today'. It's when I know I'm gonna stick under it, I fill it in properly, if I know I've gone over it, and the food's too difficult to log, I just don't bother, because it's too much hassle for what.

Similarly as Ruth, Georgina found some calories – like the calories of wine – not worth the effort of logging as the knowledge that calorie limit was breached when she was socialising was not helpful in her weight loss attempt. Measurements are reactive, as they intervene and often discipline the world they depict (W. N. Espeland & Stevens, 2008). Ruth's and Georgina's examples indicate that sometimes participants did not find the 'reactivity' of all calorie counts useful, and therefore sometimes chose which numbers to 'make'. Only the 'successful' days below the limit were logged as they made participants feel good about themselves and helped them be motivated and continue with calorie counting. In contrast, there was no use in seeing the numbers of 'unsuccessful' days when calorie limit was breached, and which would only reflect 'failure'.

The stories of participants might not exactly indicate the 'soft resistance' (Nafus & Sherman, 2014) found among other self-tracking activities. Yet, they reveal defiance of the scenarios of use embedded in the app (i.e. log everything that you eat) as users negotiated control and release (Crawford 1984) for calorie counting that would be useful and comfortable to them.

6.5 Discussion and conclusion

Current literature on weight loss practices does not focus much on the practices of dieting, or how they influence daily lives or practices rather than the body or self-image. I

explored the practices of dieting by calorie counting, and the findings emphasise three points. Firstly, calorie counting, even if somewhat automated with such apps as MyFitnessPal, is not effortless, nor done without some planning. Earlier research on online dieting (Niva, 2015), commercial weight loss groups (Stinson, 2001) and surgical weight loss (Groven, Råheim, & Engelsrud, 2015) has shown these activities as also requiring considerable effort. As instead of investigating the attitudes and/or feelings towards calorie counting, I have explored the ‘doing’ of calorie counting, the present study supplements this common finding by ‘unboxing’ the efforts. Calorie counting, as any other practice of counting, involves ‘procedures for assigning numbers to objects’ (Martin & Lynch, 2009, p. 261). Thus, people using technologies such as MyFitnessPal had to put a lot of effort to ‘make’ the numbers of calories. It required finding the time, tools like scales, and knowledge, not to mention skills, to employ all these correctly.

Therefore, secondly, the present exploration of practical aspects of calorie counting shows that there is no unified way to count calories and, thus, the objective number of calorie count was achieved in messy ways. Each user responded differently to the practical and ‘ethical’ considerations, and negotiations involved in calorie counting. De la Rocha (1986) divided her participants into two groups based on their way of dieting. I found that the participants of the present study could not be classified that categorically. They ranged on a continuum between relaxed and very precise counting, with some switching places depending on the practices (e.g. would log food in advance, but would not measure). As they were not looking to build a precise record of their calorie consumption, participants did calorie counting in the way that best fitted their goals, lifestyle (sports enthusiasts needing more precision or people wanting to lose weight needing approximation) and practical arrangements.

This leads to the third point. Earlier research has noted that dieting (Bordo, 1993; Heyes, 2006) or weight loss surgeries (Throsby, 2008) can affect not only the body but also the experience of self. I want to extend this argument, as a close look at the practices of calorie counting lets us see how calorie counting both *influences* routines of people doing it and is *influenced* by them. Needing to log food eaten affects eating practices. Compared to usual food practices (Comber et al., 2013; Kerr et al., 2014), food practices when dieting are more regulated as food needs to be standardised, classified and counted. For instance, people rarely measure foods and ingredients (Kerr et al., 2014). However, dieters needed to know *how much* they are eating and, therefore, measure food before eating. Measuring of food often redefined the meaning of portions and suggested ‘safe’ amounts of food. Moreover, some participants related to food through its calories as often they dictated in advance what could be ‘safely’ eaten to fit in the daily goal or indicated that less food needs to be eaten in the morning to be able to enjoy a dinner in the restaurant. Thus, calorie counting through practices it requires influenced participants’ perception of food and their eating habits.

Yet, despite its requirements and influence, calorie counting with MyFitnessPal needs to be appropriated by the user so that it becomes feasible and blends into daily life. The participants knew that the best time to log food was when it was eaten, but they often logged whenever it suited them best. They knew that to be precise they need to measure food, but this often was seen as too burdensome or unnecessary, and participants resorted to more suitable ways of determining quantities of food eaten. Similarly, they knew that according to MyFitnessPal, if they wanted to lose weight they need to stick to the daily calorie limit, but sometimes they would still digress from it to be able to enjoy social meals out. Thus, the use of MyFitnessPal shows dieters negotiations between what was

needed and what was convenient, rather than a blind following of the suggestions of the app.

Overall, exploration of the so far overlooked practical aspects of dieting provides us with a better understanding of the relationship between the practice of dieting (as well as technologies used) and those engaged in it.

CHAPTER 7

WHAT DOES NOT COUNT: 'INDIVIDUAL QUANTIFICATION' WITH MYFITNESSPAL

7.1 Introduction

Quantification is 'the production and communication of numbers' (W. N. Espeland & Stevens, 2008, p. 402). Espeland and Stevens (2008) outlining sociological dimensions of quantification have called for a sociology of quantification. In this chapter, I respond to this call by exploring quantification at the level of an individual and how it affects choices, food choices in this case, in the everyday.

I define 'individual quantification' as quantification done by a single individual for her/himself only. I argue that 'individual quantification' is different from what I refer to as 'institutional quantification' – quantification that is done and is governed by institutions. Everyday contexts in this chapter mean practices that are done daily and are commonplace. By studying 'individual quantification' in the everyday context, I will broaden the perspective of current social science discussions on quantification, which have largely focused on 'institutional quantification'.

One of the common individual quantification practices that can be encountered in everyday contexts is food quantification. Researchers have explored the effects of nutritional quantification among different countries and communities (Mudry, 2009; Yates-Doerr, 2012), but so far, apart from De La Rocha (1985, 1986), we know little about quantification of food that is performed by individuals in everyday contexts. I fill this gap

by investigating food quantification as it is done by individuals. In particular, I study for whom it is done and by whom regulated as well as its effects and their limits.

I consider calorie counting as a practice of dieting and self-tracking as an example of ‘individual quantification’. Calorie counting translates food into calories, and the goal of such quantification in the contemporary historical context is usually to avoid consuming too many calories in order to lose weight. One of the ways to count calories is to use websites or apps, and I chose to focus on the use of MyFitnessPal, which is one of the most popular and best-evaluated calorie counting apps (Dredge, 2016). While researchers have explored self-tracking, especially among QS community, they neglected the quantification that is embedded in it. By exploring how individuals use MyFitnessPal, I will identify some of the defining features of individual quantification, its effects on users’ food choices and the limits of those effects.

I divide this chapter into three sections. The first section sets the background for this chapter by discussing social science research on ‘institutional quantification’. The second section explores individual quantification with MyFitnessPal distinguishing two features of this quantification. The participants had to govern themselves and thus were responsible for the truthfulness of their logs and were able to opt in and out of quantification. I discuss how these features stand in contrast ‘institutional quantification’, which I argue is more restrictive. The third part of this chapter discusses how quantification guides decision making in everyday contexts. I show how, similarly to ‘institutional quantification’, it affects behaviour, such food-related decisions as whether to eat, what to eat and how much to eat. Nonetheless, I found that while calorie counting shaped their decisions, the users of MyFitnessPal kept bringing in other values of food, such as taste, health or being ‘filling’, to the equation when choosing foods. Thus, I argue that quantification at the individual level is more flexible and transient than ‘institutional quantification’, where multiple

actors and institutional arrangements are required to sustain adherence. I also suggest that by focusing on individual and everyday quantification we are better able to see the limits of quantification's effects.

7.2 'Institutional quantification'

There has been a spate of recent social science scholarship on quantification. I focus on three major strands of this literature, namely scholarship on governmentality, sociology of science and studies on rankings, especially Espeland and Stevens' influential work on the concept of quantification in the context of law school ranking in the US.

Scholars influenced by Foucault's notion of governmentality (C. A. Miller, 2005; P. Miller, 2001; Rose, 1991) have discussed how quantification plays a key role in the government of populations. Rose notes that 'there is a constitutive interrelationship between quantification and democratic government' (Rose, 1991, p. 675) because democracy requires numbers to establish its legitimacy. Quantification is needed as the technology of power used by institutions, and it is further demanded from those who are being governed as numeracy is an essential feature of self-governance. Miller (2001) highlights that counting practices should be understood and analysed as 'technologies of government,' as they enable the programs of government. For example, as a technology of government, management accounting is invested in creating 'the responsible and calculating individual' – calculating self – which would pursue 'prescribed and often standardised targets' (P. Miller, 2001, p. 380).

Illustrating the importance of quantification for governing, Miller (2005) shows how creation and use of indicators of sustainable development (ISD), and through it, quantification could also be seen as a component of civic epistemology. While for a long time statistics have been 'the language of a modern state' (C. A. Miller, 2005, p. 404) that

depersonalised political decisions, in this case, the indicators were used by people and international organisations to redraw the measures of wellbeing to challenge the authorities. Statistical data that has previously given power to certain measurements of wellbeing was reinterpreted, or new statistical measurement programs were defined by citizens and NGOs. Quantification, in this case, transformed not only the understanding of wellbeing but also the communication between the state and its citizens. Hence, quantification can be a tool to ensure self-governance of citizens as well as a tool for citizens to direct government.

Similarly, sociologists and historians of science have discussed the effect that quantification has on scientific processes and findings (Ackerman, Darling, Lee, Hiatt, & Shim, 2016; Martin & Lynch, 2009; Porter, 1995; Potter et al., 1991). For instance, Porter (1995) argues that numbers can be seen as a strategy of communication, as they are closely tied to forms of community. He shows that quantification is a ‘technology of distance’ – the language of mathematics is highly dependent on rules, which are uniform around the globe, and as a consequence, quantified information can travel easily and quantification diminishes the necessity for personal trust (Porter, 1995, p. ix). Therefore, quantification can be seen as one of the factors that enable science to be a global network rather than a set of local communities.

Another aspect of quantification of science is noted by Ackerman and colleagues (2016), who showed how decisions about which variables to study in gene-environment interaction (GEI) research depends largely on how easily they are quantifiable.

Environmental factors, like diet, especially if reported by participants, are seen as not rigorous and objective enough to be included in the research. The complexity is exchanged for statistical significance. Furthermore, numbers of variables sometimes need to be tweaked to produce better end calculations. Thus, Ackerman et al. (2016, p. 213) argue

that a moral economy of quantification exists among GEI scientists – quantification does not just provide strategies to produce more accurate knowledge, but rather it operates ‘through collectively negotiated virtues – virtues that are ascribed to research objects, procedures, and scientists themselves’ revealing the politics influencing the production of knowledge in the field. Thus, in science, where quantification is pervasive, numbers are not just mirroring reality, but also represent certain values.

Another domain where the workings of quantification have been explored is studies of rankings (Power, 2004; Sauder & Espeland, 2009). Espeland and Sauder (W. N. Espeland & Sauder, 2007) explore how the indicators, constructed to enable the ranking of US law schools, change their administration and policies. Sometimes this is done by ‘gaming’ (W. N. Espeland & Sauder, 2007, p. 24) the numbers, by for example reporting graduates as employed even if the job is not in legal services, in order to score better in the rankings. Furthermore, the numbers of rankings not just measure and describe the situation. Instead, ‘numbers as representations intervene in people’s interpretations and places to which they are applied’ (W. Espeland, 2016, p. 280). This is achieved through two mechanisms – reverse engineering (deconstruction of ranking and evaluation of factors that could be controlled) and emotional attachment (numbers cause emotions which can stimulate collective identities). Hence, numbers in rankings are both actively shaped by and are shaping the behaviours of those being ranked.

From these three domains above, we can see that as Espeland and Stevens (2008, p. 402) note ‘quantification is a constitutive feature of modern science and social organization’. The studies outlined above provide insights on the impact of quantification on institutional processes in government, science and higher education. At the same time, authors discussing quantification have noted its prevalence in individual and everyday contexts. For example, Power (2004, p. 774) observes that:

people in developed societies are accustomed to operating in an everyday world of numbers relating to sport, personal finance and health. Individuals are increasingly aware of their blood pressure and cholesterol levels, the media regularly report the inflation rate and economic growth, and a whole range of other numbers for normalizing and equalizing are popular currency, for example, batting averages for cricketers.

More particularly, Miller (1992, 2001) refers to ‘calculating selves’ – individuals like teachers, workers, doctors, who are ‘encouraged or required to evaluate their own activities and those of others through the calculative routines of accountancy’ (P. Miller, 1992, p. 245). Yet, he explores the ‘calculating selves’ as an effect of accounting rather than looking at the everyday quantification practices of the individual selves. So, even if our lives are permeated by numbers, the use and making of numbers in everyday context has largely remained unexplored by social scientists.

There are a few examples, like Lave (1988), who has explored mental processes, especially those of counting and mathematics in everyday situations as opposed to the usual, restrictive laboratory context. She observed the use of mathematics in the supermarkets and noted the difference between these calculations and those of school maths. More related to this present study, De La Rocha (1985, 1986) studied measuring practices of Weight Watchers’ dieters and noted that dieters often switch between precise and ‘non-normative’ ways of measuring, such as using ornaments on the crockery as indicators of a certain amount of food. Similar insights are provided by the research in ‘street’ mathematics (Nunes, Schliemann, & Carraher, 1993) and ‘ethnomathematics’ (D’Ambrosio, 1985). While these studies offer an insight into the practices of everyday measurement – *how* people count and measure – it remains unclear how quantification *affects* the everyday practices in which it is involved.

7.3 Individual quantification

As noted earlier, almost all studies on quantification have focused on ‘institutional quantification’, mainly in government, science and rankings. There is hardly any research on individual quantification – how quantification is done by individuals and what its effects are. In this section, I will outline the features of individual quantification and contrast them to ‘institutional quantification’.

In particular, I focus on MyFitnessPal as an app for food quantification. In studying users of MFP, I identified two main features of individual quantification that render it different from quantification performed in institutional contexts. First, individual quantification is performed alone and is done for oneself only. Second, it relies on self-governance, which on the one hand requires people to discipline themselves, and on the other hand, allows them to evade discipline or punishment. ‘Individual quantification’ is reminiscent of Miller’s ‘calculating selves’ (P. Miller, 1992, 2001) as users of MyFitnessPal are made accountable and responsible through the use of numbers. However, Miller has only discussed calculating selves as an effect of ‘institutional quantification’, but the examples below reveal how calculating selves play out at the individual level and everyday context.

7.3.1 QUANTIFYING FOR YOURSELF

Self-tracking is often presumed to be an individual activity, usually done solely for the interest of the tracking person. In the Quantified Self community too, self-tracking is presented as allowing engagement in $n=1$ experiments. In the case of QS, however, self-tracking experiences and knowledge are shared in the community online or offline.

However, the participants only sometimes talked with friends and family about their calorie counting, and few had friends on MyFitnessPal, who could see what they were eating or support their dieting by liking their activities even though such sharing is enabled

by the app. In fact, while some participants were happy to discuss their calorie counting with others, none of them was tracking calories *in order to* share this information with someone else.

A critical reader may point that all the data collected by the users of various self-tracking devices, especially free apps, are being gathered and analysed as big data by the providers of those devices, and most likely sold to third-parties (Boyd & Crawford, 1986; Shklovski, Mainwaring, Skúladóttir, & Borgthorsson, 2014). Therefore, self-tracking is not that isolated. However, when discussing calculating selves and practices of accounting, Miller (1992, p. 253) notes that ‘the performance of calculating selves may be assessed by others without their knowledge, or against their wishes, even as they actively assess the performance of others’. However, despite collected data being used to gather information on a broader scale, I argue that self-tracking, when done on a voluntary basis, is mainly governed by the individuals. For example, Stephen is surprised by the question if he shares the information with others:

Q: Yeah. But you would enter the drinks and everything?

Stephen: Yeah, yeah. Well, there’s no point, no point otherwise, is there?

Erm, this is just for you, I never posted any of this information anywhere, this is for me, I would share it with my wife and say, oh look, I’ve done my lot today, you know. But that’s about it.

Stephen’s quote shows that using MyFitnessPal is an individual endeavour, as he emphasises that logging is private for him, even if he might share some insights with his wife. Further, Stephen reasons that because he is counting calories for him only, there is no point in avoiding logging certain foods or drinks – doing it alone, for yourself he concludes, renders dishonesty meaningless as you are only accountable to yourself.

Similar thoughts were shared by Dom, a teacher in his forties, who told that he was not interested whether his friends were also using MyFitnessPal:

I didn't look to see whether other friends were using it, I don't really know.

I think I've kind of just wasn't concerned whether they were or not. Maybe it was my own little journey, in that sense it was private, it was kind of my experience, and I didn't want it to be a shared experience, I wanted it to be my own.

Weight loss endeavour with MyFitnessPal for Dom was his 'little journey', which he did not think he needed to share with his friends. Dom remained private about his use of MyFitnessPal and did not care whether his friends shared similar experiences because he wanted his experience to stay personal and private. Hence, the quantification that was part of these men's use of MyFitnessPal was done on your own both in a sense that it was for the use of one particular person – the user himself – and also in the sense that it was rarely if ever, revealed to others.

In some settings, self-tracking can be linked to institutional goals, such as in the case of physical activity tracking where some companies have encouraged their employees to form teams and compete with others over which teams are most active (Gorm & Shklovski, 2016; Vyas et al., 2015). Some have raised concerns about this practice arguing that it changes the meaning of sport and aims to extract profit from it (Till, 2014). In other instances where individuals are tracked by someone else, as in tracking performance in the workplace, individuals are not only accountable for themselves but also for others, such as managers, which has been argued to introduce Taylorism and increase anxiety among employees (Moore & Robinson, 2015). However, as quotes above show, the participants were tracking themselves *for* themselves, and, as I will discuss below, they felt they were

responsible and accountable for themselves only. Therefore, unlike in the case of self-tracking done for or by an employer, they were not under outside pressure to continue quantifying.

7.3.2 SELF-GOVERNANCE

I distinguish two interconnected aspects of self-governance as part of individual quantification. On the one hand, when engaging in individual quantification with MyFitnessPal, users are disciplining themselves. On the other hand, because the users are doing the discipline themselves (and for themselves), they can stop quantification without ensuing punishment, bar self-loathing.

As illustrated by Stephen's quote above, individual quantification depends on personal accountability. The quantification affects and changes only the person who is quantifying. Calorie counting is done by an individual and in the case of this study, is monitored solely by the same individual. Hence, the person counting has to ensure that quantification is honest, and she/he is accountable to no one else but her/himself.

While technology was good for quantifying food consumption quickly, it was far from perfect in ensuring 'truthfulness'. For instance, Serge, a sound engineer in his forties, was surprised by finding a one-calorie carrot cake entry in the database:

I don't know how other people are using MyFitnessPal, but they're putting in things that are [weird]. I don't know if they're doing it and going – well, I want a slice of carrot cake, and I want to stay under my calorie goal, so I will put that carrot cake is one calorie, cause that's how many I've got left and then I'm gonna eat a massive slice of carrot cake, and then get to the end of the week and go – I've been on MyFitnessPal for a week, and I put on four stone! What's going on? I don't know, people who cheat at

MyFitnessPal is a bit weird because you know, you're not cheating anyone else except yourself.

Serge had lost and regained weight several times, until finally with the help of MyFitnessPal and motivation to look good for his wedding he took up healthy eating and running as part of his lifestyle. For him, it was difficult to understand how another MyFitnessPal user could have created a database entry for a carrot cake which had only one calorie. Serge saw false logging as lying to yourself, which, at the end of the day, he saw as turning against yourself as you would fail to lose weight.

This relates to the feature of 'institutional quantification' to enable trust. Porter (1995) sees quantification as the technology of distance that allows transportation of knowledge to prove one's case. Because reliance on numbers 'minimizes the need for intimate knowledge and personal trust' it is a great tool for communication across disciplines and countries (Porter, 1995, p. ix). Thus, quantification, especially at the institutional level, enables trust. However, when quantification is done for an individual by the same individual, this feature of quantification becomes less relevant. Though quantification still channels objectivity, as Serge's quote shows, numbers can be easily manipulated to suit one's need. Achieving weight loss goals with calorie counting, thus, requires trust and honesty with yourself, which numbers can help to foster, but cannot guarantee.

Thus, individual quantification was usually characterised by effective self-governing or disciplining, whereby individuals themselves (rather than institutions) ensured they 'obeyed' the device by logging food truthfully and trying to stick with the daily calorie targets. However, because, by the end of the day, the individuals were only accountable to themselves, they could opt out of both truthfulness of logging or logging and targets altogether. Hence, self-tracking like calorie counting with MyFitnessPal, quantifies

actions, habits or health of a *single* person, as opposed to ‘institutional quantification’ where it is imposed on many subjects from outside and which, therefore, might be controlled by someone else. Therefore, MyFitnessPal user could start and stop quantification as they wished. This is explored by Judy, who felt bad about stopping logging:

I think the big thing about it really is that it didn’t save me from myself in terms of stopping to eat and stopping using it, and maybe because I’m not registered with the website or anything there was nothing to call me back to it. So it sat on my phone for two years, and there’s been big chunks of time when I not used it.

Judy, who had very positive evaluations of MyFitnessPal as a dieting technology, highlights that she thought that individual adherence was the most important factor in engagement with the app. As the quote above indicates she ‘confesses’ not to have used MFP diligently, which indicates that she values self-discipline. However, at the same time, she has neglected logging calories for ‘big chunks’ of time, effectively disobeying herself and the device.

Similar practices were related by Georgina, a gardener in her forties, who would sometimes stop logging, and noticed that she would start eating more:

Yeah. And when I have a bad day, and I don’t fill anything in, invariably I eat much more than necessary simply because if you’re not filling it in, it doesn’t count, which is a really stupid attitude.

As Georgina was counting calories for herself only, she could allow herself to stop doing it when she had ‘a bad day’. She noticed that her behaviour then changed and she started to eat more because she did not need to account for it. Nonetheless, Georgina provided a

value-loaded evaluation of this behaviour as foolish because she was only deceiving herself and affecting her personal goals. These comments highlight a tension between the principle of governing oneself through quantification and constant lapses in terms of stopping quantification, which then trigger self-loathing.

On the other hand, Ruth, a lecturer in her thirties, would also stop logging when going out for a meal, but different from Georgina, she would not stop controlling her eating:

Q: But if you go out on weekdays for example, if you go out for a meal, would you input that?

Ruth: No, no. Because I don't want to look at it, I just know that I'm over. And I would try and make sure that I don't do the thing of like, oh I'm going out for a meal tonight, so I might as well just eat all day.

On the days when adherence to the calorie limit was potentially going to be threatened, Ruth preferred not to log and not to even look at the calories. Nonetheless, Ruth was thinking about the calories even when not logging food, so even if she stopped logging because of potential high calories in the evening, she aimed not to let herself go completely beforehand.

These cases illustrate how MyFitnessPal users control or govern themselves in two different ways. On the one hand, they keep close tabs on themselves in terms of logging food items carefully, keeping to their targets. On the other hand, they regularly stop counting calories or quantifying for shorter or longer periods of time, even if this makes them uneasy.

It needs to be added, that, especially in the case of MyFitnessPal and dieting in general, the need to use quantification stems from governmentality of larger scope (Foucault, 1991). For example, need to change one's weight for health or appearance can be linked

back to Foucauldian disciplinary discourses about weight's relation to health and aesthetics and feeling of responsibility to use 'technologies of the self' (Foucault, 1988). Thus, participants' freedom to stop quantification could be said to be subjected to a governing power (Foucault, 1991, 2000). Nonetheless, the choice to stop or continue logging calories remains in the realm of personal responsibility, even if, when judging more broadly, it can be seen as subjected to larger governing powers such as discourses. Thus, while 'institutional quantification' is usually instigated by an institution, such as a state, corporation, scientific community or educational establishment, individual quantification is instigated by individual people. Based on the accounts on 'institutional quantification', those subjected to this quantification, can resist the practice by passing critical commentary (as in Espeland and Saunders' interviews) or through gaming (W. N. Espeland & Sauder, 2007; Sauder & Espeland, 2009) but they can hardly avoid taking part in quantification. 'Institutional quantification' requires constant involvement as in the case of law school rankings – schools refusing to participate would be negatively seen by potential students.

On the one hand, it could be argued that the participants were Miller's (1992) 'calculating selves,' who police themselves by numbers. On the other hand, as they governed themselves *for* themselves they could stop quantifying by simply having a break or deleting the app for some time or even permanently. Whilst disciplining one's self in terms of calorie counting and stopping it could be seen as a mundane description of how people typically engage in healthy behaviours (they start them and drop them), from the point of view of quantification it illustrates how, when done at the individual level, individuals can *both* discipline themselves *and* stop as they wish, as there is no institutional context, which would enforce constant quantification. This idea of the duality of individual quantification

often gets lost when authors abstractly refer to ‘calculating selves’, which presumes quantification exerts continuous power.

7.4 The everyday effects of quantification

The research on quantification so far has mostly explored ‘the big picture’, the mechanisms of quantification at the level of the state, science or one of its disciplines. The effects of quantification have also been studied mainly in institutional contexts. My aim is to explore how quantification changes practices in the context of individual’s everyday lives. MyFitnessPal users focused on only one unit or variable when quantifying food: calories. The focus on a single unit and a single individual also made the limits of quantification apparent. Hence, individual quantification with MyFitnessPal offers a perspicuous case of quantification, which highlights and helps to explore the limits and tensions in quantification.

Using MyFitnessPal and counting calories in general usually refers to translating food into a single numerical indicator, namely calories, which reflects only one characteristic of the food – its energy value. To be more precise, a calorie is the energy required to increase the temperature of 1 gram of water by 1°C. Hence, counting calories translates to measuring of food’s potential energy value (in relation to the temperature of water) is being measured. The participants, however, did not think of calories as a measurement of energy, rather they experienced calories more as a value of food. For example, Joe, an IT technician in his late forties, noticed that his perception of food when using MyFitnessPal changed:

[...] so once you’re actually been using the app for say a month or couple of months, you grow very conscious about what you’re actually eating [...]

by looking at foods on the shelf and you think – well, that’s got 500 calories in it, even though it might not seem that much calories.

The daily calorie goal set by MyFitnessPal is also numerical and is represented by weight loss/gain in kilograms/pounds. To achieve this goal, users need to stay below the calorie limit suggested by the app based on one’s weight goals, gender and activity level.

MyFitnessPal also allowed to track the intake of macronutrients, but this was rarely observed by the participants. The participants saw this feature of the app as simplifying dieting. This is highlighted by Gemma’s, a sound engineer’s in her late twenties, evaluation of MyFitnessPal:

I mean, like I said, I’m not a nutritionist, and I don’t really understand it fully enough. But for what I’m looking for it’s perfect, it’s easy enough to say X amount of calories, X amount of exercise this is how many calories you’ve got left [...] the calories more than anything does influence what I will eat. Cause I’m not a fussy eater, I’ll eat pretty much anything [...] generally, I will base my meals approximately around the calories.

Porter (1995, p. 8) states that ‘A decision made by the numbers (or by explicit rules of some other sort) has at least the appearance of being fair and impersonal. [...]

Quantification is a way of making decisions without seeming to decide’. As Gemma’s quote illustrates, the kind of numerical simplification that quantification offers is appreciated by the users of MyFitnessPal, who find nutrition too complicated. Focusing on calorie consumption and use provides a straightforward way of dieting – one simply needs to check the calories of a meal to ensure that it fits with the daily calorie goal. No extra knowledge about nutrition is required, and the decision about eating can be seen as directed by the app.

Examining the use of MyFitnessPal allows extending the scope of the social world in which quantification intervenes as the focus is not only on individuals and but also on a case where quantification employs a single unit. This simplification helps to scrutinise everyday decisions in calorie counting with MyFitnessPal and delineate the limits of quantification on an individual level. I divide the further section into two parts: first, exploring the immediate effects of everyday quantification and second, showing the limits of quantification when everyday food choices are concerned.

Researchers of ‘institutional quantification’ have shown how quantification affects not only what is and can be counted (Ackerman et al., 2016; Martin & Lynch, 2009), but also the actions of those being quantified or counting (W. N. Espeland & Sauder, 2007; Grek, 2009; P. Miller, 2001). Hence, Espeland and Stevens (2008: 412) indicate ‘Measurement intervenes in the social worlds it depicts’. Complementing these studies, I show how calorie counting transformed how individuals made decisions about whether to eat, what to eat and how much to eat.

MyFitnessPal intends to help lose weight by suggesting a daily calorie allowance. In this way, as indicated previously, MyFitnessPal transformed users’ wish to lose weight into a wish to eat under a certain number of calories. To achieve this aim, they could not eat as always but had to consider the calories in foods when making food-related decisions. In this part, I will explore three decisions that participants had to consider and how they were made when using MyFitnessPal. The decisions participants talked about ranged from paying more attention to eating and foods (whether to eat?) to cutting some foods out from their diets (what to eat?). Participants concerned about the precision of their food logs sought new knowledge about portions that helped them to keep their records intact (how much to eat?). Similarly to what Sauder and Espeland (2009: 70) noted about institutional rankings, that they ‘force people to examine details that were previously ignored’ –

MyFitnessPal users had to take into account the new aspects of calories in deciding whether, what and how much to eat.

7.4.1 WHETHER TO EAT

One of the ways in which MyFitnessPal changed participants' behaviour was that it was used as a measure that would tell them whether to continue or stop eating. For example, Judy, a manager in her late forties, found that MyFitnessPal helped her to stop eating when she was bored:

Because I'm the sort of person, I don't get full really very often, so I will, and I can be really really full, and an hour later I'll eat some more. Because a lot of the time with me it's tied up with boredom, so erm, what this does is makes me stop because - oh my god, I've eaten all that today, what the hell do you want, you don't want this food, you're just doing it cause you're bored. So that's what it does for me. It quantifies what I eat and puts it in a nice little pot and says – that's enough, you as a human being of 47 years of age do not need to eat any more food today, so stop. And that might sound silly but I need that, I need that.

The quote above interestingly elaborates on various ways in which individuals can assess whether to eat or not. Judy notes that she can stop eating when she feels “full” i.e. feeling satiated. However, Judy distrusts her assessment of fullness and notes that very soon after she continues eating, because she is “bored,” so she sees her mental state to distort the bodily sensation of feeling full. Therefore, calorie counting, for her, provides an alternative and more effective (with reference to weight loss) measure from being full to assess whether to eat or not.

Martha, a university lecturer and a marathon runner in her early forties, shared a similar experience:

Normally with food choices, I don't actually feel hungry. How MyFitnessPal helps is in telling me if I've eaten enough and in a sort of barely rumbling and so on, I don't normally get to that stage. My brain would be telling me that I want something to eat, because it's bored or because the thing is tasty or whatever.

The bodily signals could not be fully trusted as they 'misinformed' by requiring dealing with boredom by eating. Therefore, if Judy or Martha felt like eating they would look at the screen to check whether the desire to eat could be backed by numbers – are there any calories left to consume for today – or whether it is just boredom. MyFitnessPal helped to interpret one's seemingly untrustworthy bodily cues – discern the 'real' hunger from 'boredom' hunger – by providing the calorie limit for the day and tracking the number of calories consumed. Thus, rather than expressed by the embodied feelings, hunger and satiety were often transformed into the number of calories logged in the app.

Quantification with MyFitnessPal rendered calories an important – and often the main – aspect to consider when thinking *whether* to eat. This way of perceiving the body could be seen as stemming from the metaphor of 'body as a machine' dating back to the 19th-century nutrition science (Mudry, 2009). The working of the body is rationalised and 'the input and output requirements of [the body as a machine] can be precisely quantified mathematically' (Turner, 1982, p. 258). The body is not or should not be guided by feelings like boredom when deciding whether to eat, but rather by calculations, especially if desired (or correct) weight needs to be achieved or maintained.

7.4.2 WHAT TO EAT?

Choosing what to eat involves evaluation of many factors like hunger, allergies, costs, convenience, cravings, etc. In the case of calorie counting, the evaluation of food is, in principle, rendered one-dimensional as one is required to only think about the number of calories. This is well illustrated by Dom, a teacher in his late thirties, who lost 38 kilograms by running and using MyFitnessPal. He recounted how he chooses ice-cream:

And over time it also kind of taught me what calories were in things and what choices you can make even choices between bad things or dietary bad things. So, you know, if you have a Cornetto you are having, I can't remember something like 250 calories or something above that, 300 calories. But if you have a Solero you are only having 95 calories.

After using MyFitnessPal, Dom's ice-cream choice became based more on the calorie values. Knowing the calorie values did not stop Dom from eating 'dietary bad things', but him to choose products, which had fewer calories. In general, many participants embarked on the search for the least calorific coffee, ice cream or other food options. As a consequence of looking for fewer calories, other values by which food could be chosen, like taste, often moved to the background when calorie counting.

When counting calories, having calorie values in mind could also stop participants from consuming something altogether. For example, Justine, a manager in her thirties, reconsidered eating chocolates in the office when she was counting calories:

[...] it stops you snacking I think more than anything. [...] for example, there's loads loads of people today brought in the big *Heroes* chocolates and *Celebrations* chocolates, and I just sat there and probably had four of them, like mindlessly. Whereas perhaps, if I was using the app right now

I'd be thinking – oh my god, actually I'm not gonna have any because that's one two hundred calories, and that's a big portion of my dinner gone.

Commensuration – 'the transformation of different qualities into a common metric' (W. N. Espeland & Stevens, 1998, p. 314) – comes in play as four chocolates equal 200 calories, which allows chocolates to be seen as equal to a 'big portion' of a dinner. Sharing and eating chocolates is part of the office social life. However, when counting calories, Justine would need to opt out of it, as it would severely reduce calories left for the day, and she would prefer a bigger dinner instead. Counting calories meant that all food choices had to be evaluated against some potential alternatives (chocolates now versus bigger dinner later). Participants were often checking calorie values of food in the app or on the packets and evaluating them against the daily calorie limit as well as against other foods. With MyFitnessPal, food choices are no longer 'mindless' but become literally calculated.

7.4.3 HOW MUCH TO EAT?

When counting calories, it is important to know the quantities eaten as different sizes and weights of food equal to different calorie values. If participants were seeking high-precision in their calorie counting, they would weigh most things they were eating, and by entering the weight into MyFitnessPal, they would get more accurate calorie value.

Whether they were weighing or not, all participants were forced to think about quantities of food they wished to log onto MyFitnessPal. Alex, a student in his late twenties, who otherwise was not a strict MyFitnessPal user, explained how he would decide how much to eat when he was using MyFitnessPal:

[...] because I was using it on sort of weight loss aim, was always kind of choosing to go for sort of portion size that it says on the packet, rather than just pouring until you reckon that's about right. So yeah, it would be sort of

50 grams [...] it was 50 grams not because it's the amount that I wanted or anything like that.

As Alex's quote indicates, for many participants, calorie counting redefined the meaning of portion: it was no longer an amount they wanted to eat, but an amount defined as a portion on a packet or on MyFitnessPal. Therefore, calories, rather than anything else tended to regulate the quantities to eat. As quantities of food positively correlate to quantities of calories, the food eaten was quantified not only by the number of calories but also by the grams of a portion.

This is further explored by Lilian, an administrator in her thirties, who was enthusiastic about MyFitnessPal as it helped her to lose weight successfully. Lilian was quite critical of her pre-MyFitnessPal eating habits because the amount of food she usually ate was not in accordance to what was defined as a portion:

I was a bit deluded, erm. For one thing, I wasn't weighing, so I'd read, oh look hundred grams of this is a hundred and seventy calories, oh, right, ok, that's about hundred grams. When really, actually, what I thought was hundred grams was double, it was two hundred grams, erm, and calories, you know [...] For me now, I'd have maybe a portion pasta about that big, whereas before it would be that big [shows with hands smaller and then larger sizes] [...] And in the end, it's, I guess really, I was a bit deluded just how much calories were in food. Portion sizes, how big my portion sizes were. [...] cause the portions I was eating originally were massive and had a lot more calories than I originally thought.

As the quote highlights, eating more than what is defined as a portion meant eating more calories than you might want when you chose the food. Lilian disapproved of her earlier

portion sizes, when, without actually measuring food, she was guessing its weight, which in turn affected calories consumed and in this way, she was deceiving herself – tracking the calories but ignoring the size of the portion. Her note that before using MyFitnessPal she was ‘deluded’ and was having bigger portions and, therefore, consuming more calories than she thought she was consuming, indicates that by using the app she has learnt to quantify food in two interconnected ways – in calories and size – and in turn was no longer in the wrong. Hence, through quantifying volumes of food to weight and then relating them to the number of calories, MyFitnessPal users could and would decide how much to eat.

The cases above illustrate that ‘individual quantification’ similarly as ‘institutional quantification’ affects behaviour and choices of those engaging in it. Calories – the unit that made food quantifiable for the participants – had an influence on their food-related decisions, in terms of whether, what and how much to eat. However, as I will discuss in the next section, the effects of ‘individual quantification’ with calories had its limits.

7.5 Quantification as commensuration and its limits

Espeland and Stevens (1998) argue that most quantification can be seen as commensuration. When discussing American Law School rankings, Espeland and Sauder (W. N. Espeland & Sauder, 2007) recognise commensuration as a mechanism of reactivity, i.e. it is a pattern of feedback elicited by quantification such as rankings. From university rankings to property prices commensuration offers a way of perceiving and valuing things. We are able to compare different institutions based in different corners of the world and regulated by different educational systems because commensuration transforms ‘different qualities into a common metric’ (W. N. Espeland & Stevens, 1998, p. 314). It can be a useful way of expressing elusive qualities with more defined ones (like

the prestige of university expressed by an amalgam of funding, research, staff and student satisfaction surveys) and easing decision making where many factors need to be considered (like choosing a property by its price). Commensuration achieves this by selectively eliminating certain information and reorganising that which remains (W. N. Espeland & Stevens, 1998, p. 318). Some commensuration is complex and requires technical knowledge, while other is simple and mundane. MyFitnessPal as a tool of commensuration seems to be somewhere in between: it attaches such technical information as calories to food or exercise but does not require its users to know how they are calculated or what they mean. The commensuration that I noticed happened the most was when participants compare different items that had similar or same calorie value.

In the present study, one effect of commensuration is that it allowed comparison of food items that were different but were from same food category such as snacks, desserts, etc. Translating food items into calories allowed them to be compared in a new way. For example, commensuration allowed participants to put one unit of a calorific item in the equation with several units of a less calorific one, making it more attractive to choose several rather than one unit for the same calorie value. By attaching calorie value to foods, MyFitnessPal made Anamaria, a postgraduate student who admitted to having a sweet-tooth, adopt a new outlook towards snacks:

But what I noticed was that I wasn't getting into it, because I was eating the same thing only less, but I started eating something completely different. Cause I started looking at calories and thinking – oh, I cannot actually eat this muffin, cause it's like 500 calories, I'm actually gonna eat an apple instead, or 4 apples at least, or something like that. So, it actually affected what I was eating.

Before using MyFitnessPal an apple and a muffin could be seen as an option for snack or dessert. When the app was used, each became a unit that acquired different values based on their calories and could be compared in a new way, so *one* muffin equalled *four* apples, edging the decision towards the option that allowed for a larger quantity. Through quantification with MyFitnessPal, a muffin stood for a certain number of calories and if this muffin was consumed calories would be subtracted from Anamaria's daily calorie limit. As calorie counting is a zero-sum game, MyFitnessPal users, like Anamaria, had to be selective about what they are eating. Commensuration, thus, often played a role in food selection in it allowed equating different kinds of foods.

Another aspect of commensuration is that it also permitted comparison of very different items that are not usually equated. Wilma, a policewoman in her forties, provided a good example of this kind comparison:

And I think – oh it's only one muffin, it's not much, but then when you scan in and see it's like 450 calories, uh, I can have two glasses of wine for that, so I start equating as to what I can have, rather than having both, I think ah, maybe I'll have the wine instead of the muffin, that's more.

Here Wilma showed the interesting arithmetic that commensuration in calorie counting enables. Wilma often had a glass or two of wine after her stressful work to relax.

Therefore, before choosing to eat a muffin she needed to think how its calories fit within her calorie allowance and the other items – like wine – she wanted to consume later. First, one muffin and two glasses of wine were *made equal by their calorie worth*. However, two glasses are more than one muffin *in terms of items that could be consumed*, so Wilma decides to drink two glasses of wine instead of eating one muffin. Using MyFitnessPal meant that the different aspects that could make foods easy or difficult to compare (e.g.

one is an alcoholic drink, and the other is a pastry) were replaced by calories. Food items acquired calorie ‘worth’ by which commensuration could be performed and choices guided. Hence, by turning small (in their scale) things, like food items, into even smaller ones, like calories, MyFitnessPal affected the way its weight-loss seeking users perceived and evaluated food.

Through the elimination of certain information and rearranging other, commensuration ‘changes the terms of what can be talked about, how we value, and how we treat what we value’ (W. N. Espeland & Stevens, 1998, p. 315). Calories themselves were a new way of talking about and valuing food for many of participants. But engaging in calorie counting took it even further as all foods became placed ‘under a shared cognitive system’ in which their place is determined by the number of calories they contained and through commensuration calorie counting ‘create[d] a specific type of relationship’ (W. N. Espeland & Stevens, 2008, p. 408) between foods. Thus, commensuration introduced a new way of talking about, valuing and treating food.

It has been noted that quantification can be limiting, like in the case of GEI research, where quantification is part of the moral economy of science, and therefore side-lining variables that are too complex to be quantified (Ackerman et al., 2016). Similarly, quantification was limiting participants of this study. As Samantha’s story indicated, numbers surrounding the food – calories and portion sizes – and the need to get those numbers correctly became the main topic among the teenagers using MyFitnessPal. This suggests that knowledge that MyFitnessPal provided could easily shift from suggestion to regulation. However, by exploring ‘individual quantification’ in the everyday context, I also found that quantification and its effects are also *limited*.

The limits of quantification MyFitnessPal can be seen in that the same number of calories would make different items equal, but in order to choose between them, participants often had to think of other values of food that would help them choose. Research on food choices has shown that when choosing food people relied on several values, like health and taste, which would need to be negotiated depending on situations (Connors, Bisogni, Sobal, & Devine, 2001). Thus, the participants did recognise that focusing on only one dimension of food – its calorie value – was a limited perspective. I identify three values of food that would come into play during commensuration to help MyFitnessPal users to choose, mainly, healthiness, satiety and taste of food. The stories of participants show that ‘individual quantification’ can constrain the choices related to food. Nonetheless, it does not determine those choices completely, as discussed in the following section.

7.5.1 HEALTHINESS

The perceived healthiness of food was one of the values that, in addition, to calories determined MyFitnessPal users’ choices. Participants interested in nutrients thought that calories did not always represent what is nutritionally better for them. Those interested in healthy eating, like Judy, noted that healthy food was often more calorific and that counting calories with MyFitnessPal ‘encourages you to find low-calorie choices or to juggle your calories, so it’s not always healthy.’ Similarly, based on their calorie value items that were seen healthy became too calorific to consume when counting calories, as noted by Justine:

Yeah, and I think also it’s really difficult when it’s like you think actually, I know that a poached egg on avocado on toast is gonna fill me up. And I really really enjoy it, but my god, the calories in it are huge, because it’s an egg yolk and it’s an avocado, and it’s a slice of bread. But I love it, and I

know that it's healthy so there like, what shall I do, there's that kind of conflict.

Researchers writing about quantification and standardisation note that these processes require ignoring certain features and highlighting those on which the quantification or standard is based (Ackerman et al., 2016; Power, 2004; Timmermans & Epstein, 2010). But when these decisions are made by 'lay', individual people on everyday matters, as Justine's quote shows, focusing solely on one aspect, like calories, while being aware of other important values of food, like healthiness, sometimes made the food choices complicated. In Justine's case, to resolve the value conflict, Justine would only eat an avocado sandwich on the weekends when she was less strict with her calorie count. Nonetheless, the values of healthiness and calorie of this meal remained in conflict when counting calories.

7.5.2 SATIETY

Satiety was another value of food that played a role in food choices made by participants. The daily calorie limit provided guidance for participants aiming to regulate their weight, but it was also restrictive and, as calories do not necessarily correlate with satiety, participants needed to learn which foods had the best relation between the calorie value and the time feeling full. Audrey, a financial advisor in her forties, thought about the chocolates she ate and compared them to an omelette, a much more filling meal:

Now, I've said to you I've eaten those three Quality Street things. If I'd eaten four, that would be 200 calories, I could have had like a three-egg omelette for that, and when you look at four chocolates that gone in 5 minutes, against the meal that's gonna keep you full for ages.

In a similar vein, Martha told that calorie counting helped her to choose food:

I think when I originally started tracking calories it helped me to make better choices of things that would be most filling for the least calories.

The quotes above illustrate that satiety was often taken into consideration along the calorie number as it related to one's hunger and, therefore, affected the number of calories consumed. Few chocolates might have the same calorie value as an omelette, but, as Audrey noted, chocolates would not keep you full for long, meaning that other foods, and therefore additional calories, will be consumed eventually. Thus here, equalised by calories foods were differentiated through the other values, like satiety, which could ultimately affect the calorie consumed.

7.5.3 TASTE

The taste was another of the values that helped participants to differentiate between items equalised by calories. Ruth recalled her efforts in choosing a sandwich for a train journey, as she was struggling to find one that had the least calories and was also tasty:

[...] it takes me ages when you buy like a sandwich when you're going on a train, it's ridiculous. I would stand at the sandwich counter and look for so long, cause you have to look quite closely to see what the calories are, and you're looking at every single one. And I always find that one that's lowest, but then I look at it and think – uh it's really not gonna be very nice, I don't think I can do that. So, right what's the next lowest?

Ruth took a while to find the least calorific sandwich, but when she did find one, she decided it is too bland and had to continue looking for something that will be both low in calories and tasty. Calories, therefore, could not be the only guide in selecting food. This is further confirmed by Stephen, who was trying to minimise the calories he consumed

during his lunch and looked for alternatives for his usual lunch items. Yoghurt was one of the items to consider:

I looked into this further, the raspberry one had less calories than the others, so I thought, raspberries alright, I can eat raspberry all day, so that's when I went for raspberry.

When Stephen found the least calorific yoghurt, he did not just swap for it straight away. He checked the taste first. Luckily, it was raspberry, and he was glad to swap to it, as it was a taste he enjoyed. The stories of Ruth and Steven indicate that, though calories were the primary guiding consideration when choosing food, taste further filtered the possible choices.

Like law school administrators who always had rankings in mind when making decisions, participants were made to always think about calorie value of the food they were about to eat. Hence, both 'individual' and 'institutional quantifications' make its subjects think more narrowly about objects when quantifying. While Espeland and Stevens (2008, p. 432) note that 'measurement also can narrow our appraisal of value and relevance to what can be measured easily, at the expense of other ways of knowing (consider how education became years of schooling in American sociology)', participants' stories show that ideas held about food before MyFitnessPal use are not supplanted completely by caloric values, but rather often they compete or are combined when choosing the food. These accounts illustrate how calorie counting while focusing attention on a single dimension of food, required those engaged in it be more resourceful and consider other features of food. The participants did not just choose the least calorific items. They still wanted their food to be healthy, keep them full for long enough and tasty. Thus, values of food that are not easily

quantifiable remained relevant even when ‘individual quantification’ of food was performed.

7.6 Conclusion

While the ubiquity of numbers and quantification in our life has been noted by many researchers, quantification and its effects are mainly examined at the institutional level. What I aimed to offer in this chapter is the insight into how quantification plays out on an individual level and everyday decisions, such as what to eat when dieting. ‘Individual quantification’ is defined by its intentionality to self, as I have shown how participants perceive calorie counting as something that they are doing for themselves only, and by self-governance, as participants highlighted the need to be truthful and accountable even if no one else is observing the tracking. On the one hand, this way it ensures the docility; on the other hand, by entrusting the governing to the subject her/himself it allows them flexibility and even freedom.

The ‘individual quantification’ is similar to ‘institutional quantification’ in that they ‘succeed by giving direction to the very activities that are being measured’ (Porter, 1995, p. 45). I have discussed how calorie counting affected the food-related decisions that participants of this study had to make. The daily calorie allowance along with calorie value of food were directing the choices made. Hence, whether at the level of the state, scientific discipline or individual food-related decisions, quantification can direct behaviour. It might seem that the main difference between ‘institutional’ and ‘individual’ quantification lays in size and scope. Still, it is important to explore everyday quantification, even if it has strong similarities to ‘institutional quantification’. As shown in this article, focusing on individuals and their everyday practices of quantification makes the workings of quantification clearer and can reveal the limits of its effects.

Understanding this helps to ensure that quantification, especially when it concerns individuals, is not perceived as all-governing, but rather a directing authority, which can, in the end, be negotiated or even evaded.

CHAPTER 8

CONCLUSION

With this thesis, I have aimed to fill a gap in the literature and enrich the current scholarly discussion on self-tracking by providing an insight into self-tracking practices in everyday context by ‘ordinary users’ (Bakardjieva & Smith, 2001). My contribution to the existing literature, is thus, two-fold – conceptual and empirical.

First, I focused on self-tracking practices, discussing with the participants engaging in calorie tracking their routine practices, strategies and personal history of self-tracking. Existing studies have outlined some of the social implications of self-tracking. Scholars have often outlined ‘revolutionary’, expectations or hopes and fears, with regards to self-tracking. Those in favour of self-tracking have argued that it provides users with ‘exosenses or wearable electronic senses’ (Swan, 2013, p. 95) that help them to take care of their bodies better. Scholars critical of self-tracking, usually post-structuralist ones, argue that those who use it ‘participate in the promotion of the healthist discourse’ (Lupton, 2013). While considering the potential positive and negative implications of self-tracking, these studies neglect the practical side of self-tracking – how people engaging in it perceive it, what they do with the self-tracking technologies and how tracking influences individual practices. Exploration of the practices of self-tracking helps to understand how those engaged in self-tracking relate to it can offer more empirically grounded arguments about its social implications. Some more recent studies (Harries & Rettie, 2016; Pink & Fors, 2017) started to focus on practices in self-tracking, showing how they are shaping other activities and perceptions. To complement these as well as works focusing on the social impact of self-tracking, I set out to open the ‘black box’ of self-tracking by exploring how self-tracking is actually done in an everyday context. This can help

understand the influence self-tracking can have on those engaged in it and outline how this influence plays out in everyday choices and practices.

Second, I shifted the focus of research on self-tracking exploring ‘ordinary’ users. So far, the empirical literature on self-tracking has predominantly focused on members of the Quantified Self (QS) community whose members are invested in improving their tracking devices and collecting often unusual data. User experience has also been researched in more instrumental usability healthcare and HCI studies – where participants have been asked to self-track and then were interviewed, with a goal to improve self-tracking technologies (Harrison et al., 2015; Kawagoshi et al., 2015). These approaches neglect the perspectives of those who are tracking on their own initiative and are, as the present study has shown, less invested in the technology and tracking. By contrast, the user I was interested in was an ‘everyday self-tracker’ – a person who started tracking on their own volition and who was not part of any self-tracking community.

The usefulness of this thesis is not only that it fills gaps in the scholarly literature. Public and private sectors have started to show interest in self-tracking. Recently NHS’s introduced fast-track funding agenda for digital technologies that included self-tracking devices and apps. Indeed, NHS has joined forces with IBM and Google’s Verily to design, implement and promote self-tracking among users of public health services suggesting that both public and private sectors have high hopes invested in self-tracking. This shows that the present levels and kinds of use of self-tracking might be just at the starting point and indicates a need for better understanding of mundane aspects of self-tracking that would help us know how people use and relate to these devices.

Meanwhile, as mentioned, the experiences and practices of those who have been tracking on their own, as part of their everyday activities, have attracted little research.

Understanding self-tracking practices in the everyday is crucial for understanding its meaning and influence on those who use it, as it is arguably the most prevalent kind of self-tracking. It is also important for understanding how processes noted or suggested in conceptual studies – such as processes of self-governance – play out in the experiences and practices of ordinary self-trackers. Lastly, and very importantly, understanding of self-tracking practices in the everyday is essential for the success of health and self-tracking apps and similar technologies that have recently been attracting the attention of – as well as funding from – both public and private sectors.

Focusing on everyday self-trackers and their practices allowed the present study to gather new insights about self-tracking that were directed towards practices, and, therefore, offered more detailed knowledge about self-tracking use and influence. More detailed account of self-tracking practices lets us better understand what is involved in self-tracking and what aspects of daily life of its users self-tracking affects and how. The focus on practices helped to analyse the mundanity of self-tracking. Exploring this mundanity was revealing: I found the simplicity of goals, the struggle with the technology, the burden of tracking, the need for strategies to fit the self-tracking in one's life and the ambiguous but important role of numbers in influencing behaviour.

This thesis aims to, if not shift the direction of current self-tracking discussions from the 'revolutionary' ideas and exceptional subjects, then at least to add an important but overlooked viewpoint to the discussion. Studying 'everyday self-trackers' and their practices helps to understand the mundane side of self-tracking. And being aware of the mundanity of self-tracking can help us to understand the experiences of various users better and anticipate the possible social implications.

8.2 The summary of findings

The research aim outlined at the beginning of this thesis was to provide better knowledge of self-tracking practice in the everyday (as opposed to the laboratory, research or QS community) context by exploring calorie counting. I set out to do this by answering three main questions, namely:

- What is self-tracking by calorie counting for those engaged in it?
- How is self-tracking by calorie counting done?
- What are the practices through which self-tracking affects those engaged in it?

Each of these questions was addressed respectively by empirical Chapters 5, 6 and 7.

Chapter 5, the first empirical chapter, discussed the differences between self-tracking as imagined by the QS metaphor and self-tracking as it is perceived and done by participants of this study. I have outlined the main characteristics of the QS metaphor with regards to goals, use and effects of self-tracking. The QS goals relate to self-knowledge and self-optimisation, as those engaging in self-tracking continually aim to improve themselves through the data gathered. The use is characterised by critical evaluation of the norms dictated by the technology being used. Moreover, in the QS metaphor users are portrayed as keen to tinker with hardware and software in order to personalise them, and they are also highly invested in analysing the collected data. The influence of self-tracking under the QS metaphor is thus life changing. Self-tracking is used to transform and create or optimise oneself and can be seen as a way of living.

Based on the interviews with people who used MyFitnessPal, I described the goals, use and effects of the ‘ordinary’ users. I found that the goals of participants were generally quite mundane, like losing some weight, to look and feel better. Regarding use, participants were not tech-savvy, as often they were not aware of technological

capabilities of MyFitnessPal app, and some struggled with the app's signature feature – barcode scanner. The effects of the app to the participants were quite limited as participants did not control their diet fully by the app's recommendations, usually used the app only temporarily and, thus, the weight they lost when using often was regained when the use stopped.

Hence, this chapter highlighted the significant discrepancies between the image of self-tracking that is portrayed by the QS metaphor and the actual engagement in practice by the 'ordinary' self-trackers. It cautioned against making swift conclusions about technologies without exploring how they are used daily by 'ordinary' users outside committed communities and research laboratories. It also provided an insightful picture of *what* self-tracking is (and is not) for those engaged in it. Based on the accounts of the participants, we can see that self-tracking can be a temporary endeavour to achieve ordinary, temporary goals, that is not highly invested in the sophisticated use of the technology, much less in modifying it.

Chapter 6 gave a more detailed account of how participants have engaged in self-tracking, describing the practical considerations that it involved. In addition, this chapter aimed to contribute to our knowledge about dieting practices. A review of the literature on dieting and weight loss reveals that, while experiences of dieting have been studied, the practices of dieting have received little attention. Here, we filled the gap by providing accounts of some practices of dieting when counting calories with MyFitnessPal, mainly practices of temporality, practices of precision and practices of manipulation.

Discussion of practices of temporality examined the importance of when the calories were logged on the app. The decision of when to log was influenced by several kinds of practical considerations, like the availability of free time or fear of forgetting what was

consumed. The participants' stories showed that the app not only has to be incorporated into existing routines but that it also affected them, for example, when participants had to interrupt their eating to log consumption.

The participants' practices of precision involved different levels of attention given to details. Some participants wanted to have very precise records of calories consumed and therefore weighted most of the foods they ate. Others were fine with having minimal precision regarding the amount as long as the log was being kept. Stories of some more diligently precise participants revealed how engagement in calorie counting can not only interrupt the eating practices, but also alter the perception of food or, more precisely, understanding of what a portion is.

Lastly, the practices of adjustment that participants discussed related to their negotiation of dieting and occasions when dieting would be dropped, like eating out with friends. Some of the manipulations were aimed at combining both dieting and eating more calories than usual – this entailed 'banking' of calories when fewer calories were consumed sometime before to create a calorie 'allowance'. However, for some participants, the wish to relax and just be able to eat and drink what they liked once in a while was more important, and so they would stop logging during the occasions where their calorie consumption would exceed the daily limit.

This chapter illustrated understanding *how* self-tracking as dieting is done; it also helps us to understand how technologies of dieting are adapted to fit into daily lives and choices. In addition, this chapter provided an insight into practices that constitute dieting – a topic that has been little explored.

The last empirical chapter, Chapter 7, examined the influence of self-tracking on those involved in it. This was done by focusing on the quantification aspect of self-tracking. The

phenomenon of quantification has been largely explored at the institutional level – scholars have studied how it works in government, science and law school rankings. But as the use of MyFitnessPal illustrated, quantification also happens on an everyday basis and is also done by individuals. In this chapter, we provided an account of such everyday ‘individual quantification’ and compared it to what we refer to as ‘institutional quantification’.

First, I discussed two features of ‘individual quantification’ that were especially apparent in MyFitnessPal use. One is that ‘individual quantification’ is done for oneself and the second one is that it relies on and induces self-governance. As the participants’ accounts illustrated, in the case of ‘individual quantification’, tracking and quantifying is done for one’s own good – there are no actors involved in quantification as no one will see or judge the numbers. For this reason, the individual who is quantifying is responsible for the continuity of the process and honesty of the numbers. The participants highlighted how any failure in quantifying was their personal responsibility, at the same time, being only responsible to themselves allowed them to stop quantifying when they wanted. This stands in contrast to ‘institutional quantification’, as ‘institutional quantification’ can be criticised, but one cannot usually opt out from it due to its embeddedness in institutional structures.

Second, I showed how quantification, when using MyFitnessPal, affects food-related decision making. In particular, I discussed how quantification guided participants’ choices of whether to eat, what to eat and how much to eat. However, when quantification allowed commensuration of very different food items, participants invoked other, non-quantifiable values that were important to them when making food-related decisions. These values were often considered alongside quantifiable calories and sometimes overruled them. Moreover, the stories of participants showed that engagement in ‘individual

quantification’ can both foster discipline and permit ending it. This revealed the flexibility that is available in everyday ‘individual quantification’ which is overlooked when discussing engagement in quantification in terms like ‘calculating selves’ (Miller, 1992). In contrast, the flexibility is usually absent in ‘institutional quantification’ as numbers often form non-negotiable rules of action.

Thus, this chapter extended the discussion on quantification by examining its individual practices and contrasting them to the commonly studied institutional quantification. By doing this, it also showed how practices of self-tracking with MyFitnessPal affected the food-related decisions and highlighted the flexibility that is embedded in this kind of self-tracking. Some participants sometimes chose to opt out of logging, staying outside self-tracking and its impact altogether.

On their own, each chapter not only presented the perceptions, practices and influence of everyday self-tracking, but also contributed to better understanding of the differences between QS metaphor of self-tracking and everyday self-tracking, practices of dieting, and quantification. Altogether, the empirical chapters complement each other and help to draw a wholesome picture of self-tracking done in the everyday.

8.3 Contribution

As outlined in the literature review, in this thesis I engaged with three groups of literatures coming mainly from healthcare research, HCI research and social science research. In addition, I looked at self-tracking and related to the literature on it through the lens of STS. I was mainly influenced by the following ideas: diversity of technology users, move from studying the ‘revolutionary’ to ‘ordinary’, opening of the ‘black-boxes’ and focus on practices. In this section I will discuss how my thesis engaged with ideas from the outlined groups of literature and what contribution it made to each group.

8.3.1 HEALTHCARE RESEARCH ON SELF-TRACKING

As indicated in the literature review, healthcare research on self-tracking has influenced this thesis only marginally. Nonetheless, the focus on barriers and facilitators in behaviour change and behaviour change itself are close to the interests and aims of this thesis. The healthcare research works that explore behavioural change and what helps or hinders it initially informed my understanding of how this topic can be studied and what is known so far about it in relation to self-tracking.

Though I did not focus on behaviour change directly and did not have a normative outlook to technologies and their use as health researchers who aim to find technologies that support behavioural change might do, my findings offer useful insights for the healthcare research. I found that self-tracking indeed shaped participants' behaviours and perceptions about food. An insight that might be useful for healthcare research is that the influence was not all-encompassing or fundamental. While often participants' choices were guided by information about calories, some choices evaded this influence as users leaned towards the influence of other factors, like social occasions or other values of food.

I also found that self-tracking technologies are most often used temporarily and their influence too is temporary, usually lasting only while the technology is used. This is a useful insight for healthcare studies which examine self-tracking use only for limited periods of time. My findings indicate that any usefulness and influence derived from self-tracking might be limited to the short period its use is being studied. Similarly, the fact that self-tracking technologies at the moment are providing only quite generic numbers and advice might be linked to the finding that users to stick to them only temporary. Thus, longer periods of study or examination of users' behaviour several months after study

might be beneficial for healthcare research that aims to establish the lasting influence of self-tracking.

This highlights that the guidance of technology is not taken by users as an absolute authority, even when users are motivated to reach their weight goals. With these findings, I contributed to understanding of how people engaging in self-tracking relate to the information it provides, which is important for healthcare research. This shows that guidance and aims of healthcare oriented self-tracking need to be aligned with other aspects of patients/users lives.

8.3.2 HUMAN-COMPUTER INTERACTION RESEARCH ON SELF-TRACKING

HCI research on self-tracking provided a valuable contribution to this thesis by its focus on the use of technology and by highlighting the importance of studying different user groups. Studies of less explored group of users which HCI pursue offers new and different insights. With my findings I continue this path of examination of different, less explored user groups. My research participants were unlike those explored by HCI: neither completely new users, nor abandoners of self-tracking, nor were they a QSer type of technology experts. Hence, as HCI research is interested in exploring diversity of users and uses, my findings offer a valuable contribution towards this cause.

Everyday self-trackers' perception of and attitudes towards self-tracking and its technologies seemed to be a combination of both new users and those who abandon self-tracking. They share the scepticism about self-tracking technology's value in terms of the information and advice it provides. Thus, everyday self-trackers just like those who abandoned self-tracking were treating the information from technology as a potential advice rather than as a prescription. However, unlike new users and some abandoners,

everyday self-trackers found that technology did meet their needs and often helped to achieve their goals.

HCI's core focus is on the ways technology is being used and interacted with. HCI analysis of the ways users engage with self-tracking provided me with a starting point for exploration of self-tracking technology use in my study. Focusing on use I learned about the efforts that self-tracking as calorie counting requires in order to obtain or 'make' the numbers of calories for the food consumed. This is especially detailed in Chapter 2. These efforts comprise strategies that self-tracking technology use requires. In addition to the efforts, to 'make' the numbers of calories people engaged in calorie counting had to have time, tools and knowledge about food and its measurement. These findings illustrate the complexity of self-tracking 'in the wild' where it is embedded in and shaped by users' lives. This leads to my other contribution.

Because engagement in self-tracking is a part of wider user's lifestyle, the way users use and relate to self-tracking technology will be different. My research contributes insights into the variety of ways people approach self-tracking – they aspire for different levels of precision and commitment, which thus informs their use and the aforementioned strategies. I show that a user group that otherwise can be seen as homogenous, on a closer inspection can reveal minor yet significant differences in the ways use technology. This leads to variations in their response to self-tracking (technology's) demands e.g. users have different strategies of coping with consuming number of calories that is above the suggested calorie limit.

These insights inform the HCI research that intends to study use and usability of self-tracking technologies about how self-tracking must to adapt to users' lives and accommodate different needs, but also how users' lives are affected by self-tracking.

8.3.3 SOCIAL SCIENCE RESEARCH ON SELF-TRACKING

Social studies that explored self-tracking among non-QSers and their practices (Niva, 2015; Ruckenstein, 2014) informed my choice to focus on practices of self-tracking. More researchers have taken up this focus point recently (Harries & Rettie, 2016; Pink & Fors, 2017) and continue to provide me with valuable insights. These works highlighted the ways in which self-tracking can reshape other everyday activities and various dimensions of life. I continue the contribution that this literature provides to social sciences by adopting the STS lens and opening the ‘black box’ of self-tracking and looking at what people *do* when they self-track.

The contribution runs through all of the empirical chapters. In Chapter 5 the focus on practices reveals everyday self-trackers’ relation to self-tracking and its technology. This provides a useful contrast to the QS metaphor. By contrasting the metaphor of QS with everyday self-trackers I show that while it is interesting to research QSers and self-tracking in the light of QS, the insights gathered in this way might be far-removed from realities of everyday users. This can also distort the understanding of impact that self-tracking can have on the users, and thus society at large.

Chapter 6 provides details on the practices users engage in when they partake in calorie counting. This contributes not only to social science knowledge of self-tracking practice but also to that of dieting practices. Users adopt strategies to fit the practices calorie counting requires into their everyday life. Despite commitment to weight loss goals and knowledge of ‘the best practices’ of calorie counting, sometimes users would engage in practices of calorie counting that made it more convenient rather than more ‘precise’. These findings indicate that engaging in self-tracking requires effort and consideration. This is an important aspect of self-tracking that is not yet noted and explored in the

literature. Furthermore, these findings highlight the ways in which calorie counting as both self-tracking and dieting influence and is influenced by people's routines.

In Chapter 7 I show through what practices the influence of self-tracking materialises. I found that through practices of quantification self-tracking shapes people's choices of food and eating. Yet quantification is not overpowering. As food becomes quantified and different food items become easier to commensurate, to make decisions about food people counting calories incorporated other values, such as taste, satiety and health. Negotiating or making compromises between different values, such as taste and calories, when choosing a food item, such as a sandwich, is rather mundane. Yet these negotiations contribute to the better understanding of the scope of freedom that is available when quantifying.

My last contribution to social science literature is exploration of process of quantification in self-tracking. Social sciences scholars have explored the quantification at work in various areas like science and government. Yet, surprisingly quantification in self-tracking has so far been mostly neglected by social scientists despite the fact that quantification is the basis of self-tracking - it turns various experiences, body functioning and habits into numbers. In Chapters 6 and especially 7, I aimed to connect these two research themes – quantification and self-tracking – which, though closely tied have not yet been addressed as connected. Joining these themes together and exploring them through an STS lens helped to examine and refine ideas on quantification existing in the social science literature (and beyond).

Researchers argue that quantification drives self-governance (Gilmore, 2015; Jethani & Raydan, 2015) However, self-governance driven by self-tracking and its data does not seem to be a simple, one-way interaction where numbers dictate the self-tracker's choices

and experiences, as the ‘data fetishism’ argument implies. In particular, I find that the transformation ‘from the haptic to the optic in the configuring of the body/self’ and the increasing trust in ‘the “numbers” over physical sensations’ that Lupton (2013a, p. 399) argues are impelled by mHealth technologies such as MyFitnessPal, are not an unequivocal part of the participants’ experience. On the one hand, participants sometimes relied on the numbers to decide if and what they should eat. Quantification allowed commensuration (Espeland & Stevens, 1998) of often very different items, like alcohol and pastries, which in turn informed decisions on calorie values. But on the other hand, to make a choice between foods made equal by commensuration often required consideration of values of food that relate to embodied senses and evaluation, like taste and satiety. Thus, various values of food were not always overpowered by the calorie numbers displayed by MyFitnessPal. Hence, self-tracking involves interaction and negotiation with numbers, rather than simply adhering to them.

My study of quantification in self-tracking also expands our understanding of the nature of quantification – it is not just a phenomenon of large institutions, which, as Rose (1991, p. 675) argues, derives its legitimacy and political power from numbers, like established science or democratic government. The exploration of self-tracking in this thesis highlights the individual aspect of quantification. The experiences of everyday self-trackers I have interviewed illustrate how people relate to quantification in their everyday lives. As mentioned earlier, the relation between self-trackers and quantification is marked with deliberation, but it is also a flexible one. Everyday self-trackers were engaging in ‘individual quantification’ in order to control their eating, but they were not or at least did not feel, obliged to track every item that passes their lips. Instead, some of them skipped logging when they felt the need. This indicates that quantification does not have as strong a hold on individuals as it does on institutions.

8.4 Limitations and future research

The main limitation of this thesis is the focus on a single app. The findings, thus, cannot be said to be applicable to all self-tracking experiences, as different self-tracking technologies track different aspects and work differently, requiring different levels of user engagements. That said, MyFitnessPal is one of the most popular calorie counting apps, and the data set included 31 interviews, together this can be seen as providing a good overall picture of the use of similar apps. Moreover, the aim of this thesis was to provide better knowledge of self-tracking practices in everyday, and while the findings cannot be generalizable, the thesis offers a solid base of the knowledge it sought to attain.

As mentioned earlier, the negative side of self-tracking could have been addressed better in the current research. The overly positive evaluations of MyFitnessPal did not raise any concerns until I tried to use MyFitnessPal and struggled, and when it was too late to question participants about their negative experiences with the app. This is an important topic that would help to understand better wider self-tracking implications and, thus, to which future research should be oriented.

Everyday experiences of self-tracking remain an important and open avenue for future research. Future research could explore experiences of self-tracking when different kinds of apps and technologies are used. For example, in use of pedometers or sleep trackers there is little manual input and, therefore, the relationship with the technology is different than that with apps like MyFitnessPal, where users have to input most of the data themselves. As technologies like pedometers require little interaction from the user, the experiences of self-tracking with them can be found to be complementing those discussed in this thesis.

Moreover, future research would gain from using more participatory methods, like ecological momentary assessment, that would help to capture the practices of self-tracking better as they are happening, allowing to attain a more detailed understanding as well as helping to ask participants more specific questions.

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APPENDIX A – ETHICAL CLEARANCE CHECKLIST

**Ethics Approvals (Human
Participants) Sub-Committee**



Ethical Clearance Checklist

Has the Investigator read the 'Guidance for completion of Ethical Clearance Checklist' before starting this form?	Yes
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Project Details

1. Project Title: Pilot study on MyFitnessPal users' experience for Gabija Didziokaite's PhD research

Applicant(s) Details

2. Name of Applicant 1: Gabija Didziokaite	10. Name of Applicant 2: Paula Saukko
3. Status: PGR student	11. Status: Staff
4. School/Department: Social Sciences	12. School/Department: Social Sciences
5. Programme (if applicable): Click here to enter text.	13. Programme (if applicable): Click here to enter text.
6. Email address: g.didziokaite@lboro.ac.uk	14. Email address: p.saukko@lboro.ac.uk
7a. Contact address: Department of Social Sciences Loughborough University Leicestershire LE11 3TU UK	15a. Contact address: Department of Social Sciences Loughborough University Leicestershire LE11 3TU UK
7b. Telephone number: 07707404119	15b. Telephone number: +44 (0)1509 223357
8. Supervisor: No	16. Supervisor: Yes
9. Responsible Investigator: No	17. Responsible Investigator: Yes

Participants

Positions of Authority

18. Are researchers in a position of direct authority with regard to participants (e.g. academic staff using student participants, sports coaches using his/her athletes in training)?	No
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Vulnerable groups

19. Will participants be knowingly recruited from one or more of the following vulnerable groups?	
Children under 18 years of age	No
Persons incapable of making an informed decision for themselves	No
Pregnant women	No
Prisoners/Detained persons	No
Other vulnerable group Please specify: Click here to enter text	No
If you have selected No to all of Question 19, please go to Question 23.	
20. Will participants be chaperoned by more than one investigator at all times?	Choose an item
21. Will at least one investigator of the same sex as the participant(s) be present throughout the investigation?	Choose an item
22. Will participants be visited at home?	Choose an item

Researcher Safety

23. Will the researcher be alone with participants at any time?	Yes
If Yes, please answer the following questions:	
23a. Will the researcher inform anyone else of when they will be alone with participants?	Yes
23b. Has the researcher read the 'guidelines for lone working' and will abide by the recommendations within?	Yes

Methodology and Procedures

24. Please indicate whether the proposed study:

Involves taking bodily samples (please refer to published guidelines)	No
Involves using samples previously collected with consent for further research	No
Involves procedures which are likely to cause physical, psychological, social or emotional distress to participants	No
Is designed to be challenging physically or psychologically in any way (includes any study involving physical exercise)	No
Exposes participants to risks or distress greater than those encountered in their normal lifestyle	No
Involves collection of body secretions by invasive methods	No

Prescribes intake of compounds additional to daily diet or other dietary manipulation/supplementation	No
Involves pharmaceutical drugs	No
Involves use of radiation	No
Involves use of hazardous materials	No
Assists/alters the process of conception in any way	No
Involves methods of contraception	No
Involves genetic engineering	No

Involves testing new equipment	No
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Observation/Recording

25a. Does the study involve observation and/or recording of participants?	Yes
If Yes:	
25b. Will those being observed and/or recorded be informed that the observation and/or recording will take place?	Yes

Consent and Deception

26. Will participants give informed consent freely?	Yes
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Informed consent

27. Will participants be fully informed of the objectives of the study and all details disclosed (preferably at the start of the study but, where this would interfere with the study, at the end)?	Yes
28. Will participants be fully informed of the use of the data collected (including, where applicable, any intellectual property arising from the research)?	Yes

29. For children under the age of 18 or participants who are incapable of making an informed decision for themselves:	
a. Will consent be obtained (either in writing or by some other means)?	Choose an item
b. Will consent be obtained from parents or other suitable person?	Choose an item
c. Will they be informed that they have the right to withdraw regardless of parental/guardian consent?	Choose an item
d. For studies conducted in schools, will approval be gained in advance from the Head-teacher and/or the Director of Education of the appropriate Local Education Authority?	Choose an item

e. For detained persons, members of the armed forces, employees, students and other persons judged to be under duress, will care be taken over gaining freely informed consent?	Choose an item
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Deception

30. Does the study involve deception of participants (i.e. withholding of information or the misleading of participants) which could potentially harm or exploit participants?	No
If Yes:	
31. Is deception an unavoidable part of the study?	Choose an item
32. Will participants be de-briefed and the true object of the research revealed at the earliest stage upon completion of the study?	Choose an item
33. Has consideration been given on the way that participants will react to the withholding of information or deliberate deception?	Choose an item

Withdrawal

34. Will participants be informed of their right to withdraw from the investigation at any time and to require their own data to be destroyed?	Yes
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Storage of Data and Confidentiality

35. Will all information on participants be treated as confidential and not identifiable unless agreed otherwise in advance, and subject to the requirements of law?	Yes
36. Will storage of data comply with the Data Protection Act 1998?	Yes
37. Will any video/audio recording of participants be kept in a secure place and not released for any use by third parties?	Yes
38. Will video/audio recordings be destroyed within ten years of the completion of the investigation?	Yes
39. Will full details regarding the storage and disposal of any human tissue samples be communicated to the participants?	Yes
40. Will research involve the sharing of data or confidential information beyond the initial consent given?	No
41. Will the research involve administrative or secure data that requires permission from the appropriate authorities before use?	No

Incentives

42. Will incentives be offered to the investigator to conduct the study?	No
43. Will incentives be offered to potential participants as an inducement to participate in the study?	No

Work Outside of the United Kingdom

44. Is your research being conducted outside of the United Kingdom?	No
If Yes:	
45. Has a risk assessment been carried out to ensure the safety of the researcher whilst working outside of the United Kingdom?	Choose an item
46. Have you considered the appropriateness of your research in the country you are travelling to?	Choose an item
47. Is there an increased risk to yourself or the participants in your research study?	Choose an item
48. Have you obtained any necessary ethical permission needed in the country you are travelling to?	Choose an item

Information and Declarations

Checklist Application Only:

If you have completed the checklist to the best of your knowledge, and not selected any answers marked with an * or †, your investigation is deemed to conform with the ethical checkpoints. Please sign the declaration and lodge the completed checklist with your Head of Department/School or his/her nominee.

Checklist with Additional Information to the Secretary:

If you have completed the checklist and have only selected answers which require additional information to be submitted with the checklist (indicated by a †), please ensure that all the information is provided in detail below and send this signed checklist to the Secretary of the Sub-Committee.

Checklist with Generic Protocols Included:

If you have completed the checklist and you have selected one or more answers in which you wish to use a Generic Protocol (indicated by #), please include the Generic Protocol reference number in the space below, along with a brief summary of how it will be used. Please ensure you are on the list of approved investigators for the Generic Protocol before including it on the checklist. The completed checklist should be lodged with your Head of Department/School or his/her nominee.

Full Application needed:

If on completion of the checklist you have selected one or more answers which require the submission of a full proposal (indicated by a *), please download the relevant form

from the Sub-Committee's web page. **A signed copy of this Checklist should accompany the full submission to the Sub-Committee.**

Space for Information on Generic Proposals and/or Additional Information as requested:

[Click here to enter text.](#)

For completion by Supervisor

Please tick the appropriate boxes. The study should not begin until all boxes are ticked.

- ☒ The student has read the University's Code of Practice on investigations involving human participants
- ☒ The topic merits further research
- ☒ The student has the skills to carry out the research or are being trained in the requires skills by the Supervisor
- ☒ The participant information sheet or leaflet is appropriate
- ☒ The procedures for recruitment and obtaining informed consent are appropriate

Comments from supervisor:

[Click here to enter text.](#)

Signature of Applicant: Gabija Didziokaite

Signature of Supervisor (if applicable): Dr Paula Saukko

Dr Christian Greiffenhagen

Signature of Head of School/Department or his/her nominee: Prof Karen O'Reilly

Date: 19/11/2014

APPENDIX B – STUDY INFORMATION SHEET



Pilot study on MyFitnessPal users' experience for Gabija Didziokaite's PhD research

Adult Participant Information Sheet

Main Investigator

Gabija Didziokaite
Department of Social Sciences
Loughborough University
Email: G.Didziokaite@lboro.ac.uk

Supervisors

Dr Paula Saukko
Tel.: +44 (0)1509 223357
Email: P.Saukko@lboro.ac.uk

Dr Christian Greiffenhagen
Tel.: +44 (0)1509 223350
Email: C.Greiffenhagen@lboro.ac.uk

What is the purpose of the study?

MyFitnessPal (MFP) is a tool that helps people track their food intake. At the moment little research has been done on it. The aim of the study is to understand how people use MFP and whether it influences their thoughts and behaviours in relation to food and health.

Who is doing this research and why?

This study is part of a PhD project funded by Loughborough University. The main investigator is PhD student Gabija Didziokaite. She is being supervised by Dr Paula Saukko and Dr Christian Greiffenhagen. All contact details can be found at the top of the page.

Are there any exclusion criteria?

In order to be eligible to participate in this study person needs to be MyFitnessPal user.

What will I be asked to do?

Interview session

During the interview main investigator and participant will discuss participant's experiences with MyFitnessPal, his or her perception of and opinion about the app and they talk through the excerpts of MyFitnessPal diary (if provided by the participant).

Once I take part, can I change my mind?

Yes! After you have read this information and asked any questions you may have we will ask you to complete an Informed Consent Form, however if at any time, before, during or after the sessions you wish to withdraw from the study please just contact the main investigator. You can withdraw at any time, for any reason and you will not be asked to explain your reasons for withdrawing.

Will I be required to attend any sessions and where will these be?

You will need to attend interview sessions at a public place (e.g. cafeteria) and at the time that suits you best.

How long will it take?

Extracting of the food diary entries from MFP should take up to 5mins. The interview session will last between one and two hours.

What personal information will be required from me?

You will be asked to provide the food diary entries from MFP and share your thoughts on and experiences with MFP.

Are there any risks in participating?

There are no risks of participating in the study.

Will my taking part in this study be kept confidential?

The study is confidential and no information that could identify you will be disclosed to a third party. Fictitious names will be used instead of real names in any written work on the study. The recordings and diary entries, as well as interview recording and transcripts will be securely kept on main investigators computer for around three years until the submission of main investigator's thesis. After that all the collected data will be deleted.

I have some more questions; who should I contact?

Please feel free to contact main investigator at any stage of the study by email – G.Didziokaite@lboro.ac.uk

What will happen to the results of the study?

The results of the study will be used in for main investigator's PhD thesis or any other work related to it, as well as possibly be published in academic journals and/or conference proceedings.

What if I am not happy with how the research was conducted?

If you are not happy with how the research was conducted, please contact Ms Jackie Green, the Secretary for the University's Ethics Approvals (Human Participants) Sub-Committee:

Ms J Green, Research Office, Hazlerigg Building, Loughborough University, Epinal Way, Loughborough, LE11 3TU. Tel: 01509 222423. Email: J.A.Green@lboro.ac.uk

The University also has a policy relating to Research Misconduct and Whistle Blowing which is available online at [http://www.lboro.ac.uk/admin/committees/ethical/Whistleblowing\(2\).htm](http://www.lboro.ac.uk/admin/committees/ethical/Whistleblowing(2).htm).

APPENDIX C – INFORMED CONSENT FORM



Study on MyFitnessPal users' experience for Gabija Didziokaite's PhD thesis

INFORMED CONSENT FORM

(to be completed after Participant Information Sheet has been read)

The purpose and details of this study have been explained to me. I understand that this study is designed to further scientific knowledge and that all procedures have been approved by the Loughborough University Ethics Approvals (Human Participants) Sub-Committee.

Yes ☐ No ☐

I have read and understood the information sheet and this consent form.

Yes ☐ No ☐

I have had an opportunity to ask questions about my participation.

Yes ☐ No ☐

I understand that I am under no obligation to take part in the study.

Yes ☐ No ☐

I understand that I have the right to withdraw from this study at any stage for any reason, and that I will not be required to explain my reasons for withdrawing.

Yes ☐ No ☐

I understand that all the information I provide will be treated in strict confidence and will be kept anonymous and confidential to the researchers unless (under the statutory obligations of the agencies which the researchers are working with), it is judged that confidentiality will have to be breached for the safety of the participant or others.

Yes ☐ No ☐

I agree to share two weeks of MyFitnessPal food and exercise diary entries

Yes ☐ No ☐

I agree to participate in this study.

Yes ☐ No ☐

Your name _____

Your signature _____

Signature of investigator _____

Date _____

APPENDIX D – INTERVIEW SCHEDULE

Tell me about yourself

- Age
- Ethnicity
- Occupation

Tell me about your MyFitnessPal use

- When did you start to use it?
- Why did you start to use?
 - Did someone recommend it to you?
- Did you want it to help you achieve anything?
- How do you input the food?
 - Do you select foods? Scan? Do you create your own meals? Do you pull-out recipes from the web?
 - Does it take much time?
 - Can you show me how you would enter raw beetroot?
 - What other features do you use?
- Do you input your exercise as well?
- When do you input the food?
 - Separately or all at once?
- Where do you use the app?
 - Do you ever scan foods in the shop?
 - How do you input when you eat out?
 - Is there a place you wouldn't want to use it?
- Do you use only app or go to the website as well?
 - Which one do you find easier to use?
 - What do you do online? Forums, groups?..
 - Do you have any connections specifically from MFP website?

- Do you have extensive profile there?
- Do you share your MFP info with other users? Why?
- Do you follow any other users? Why?

- What do you think of MFP use so far?
 - Is it easy to use?
 - What are the pros and cons?
 - Was it helpful for you?
 - Was there anything particularly stressful? Exciting?

- How long did you use it for?
 - Was it on and off use or was it continuous?
 - How has your usage changed over time?
 - What do you think about the updates so far?

- Do your friends and relatives use MFP?
 - Do you share your experiences with them?
 - Do you share your MFP info on FB?
 - Is your MFP use a secret?

- Are you concerned about privacy?

Tell me what you think about the information MFP gives (Might be used with the food diary extracts)

- What information are you looking for? Are there specific nutrients that are more important?
 - Why is this important to you?
 - Where did you get knowledge about (certain) nutrients?
 - Is MFP helpful in getting that info?
 - Is the information easy to understand?
 - How would you like it to be different?
- Do you think the information is accurate?
 - Is it important for you that it would be accurate?
 - How do you deal with inaccuracies?

So, you mentioned you use MFP for health/weight/other reasons... What are your thoughts on health/weight/other?

- What is good health/weight/other?
- Why do you think it's important to care for your health/weight/other?
- How do you care for it?
- Where do you get info required to care?
- How does MFP feed into your knowledge? How does it help you to care?
 - Did MFP made you think differently about health/weight/other?

Now, I would like to talk about MFP influence on you.

Do you think it had an influence on you?

The way you think about food?

- Did it change the way you think about yourself?
 - Was there a moment that your perception about yourself changed because of what MyFitnessPal showed? E.g. eating too little, too much, too much this or that?
- Did it change the way you think about food?
 - Was there a moment that your perception of certain food item change because of what MyFitnessPal showed about it?

APPENDIX E – PARTICIPANT INFORMATION

	NAME	AGE	OCCUPATION	SNIPPET	USE TYPE
1.	Stacey	23	PG student	Previously used MyFitnessPal just on and off to find the calories of foods. Exercises quite heavily.	Continuous for year(s)
2.	Martha	43	University lecturer	Vegan and (ultra)marathon runner. Started using MyFitnessPal after using Boots diet, which she used to lose weight because had high blood pressure.	Continuous for year(s)
3.	Kristy	28	Personal trainer		
4.	Jay	43	Personal trainer		
5.	Freddie	30	Gym manager	Is into weight lifting and muscle building. Uses MyFitnessPal to lose fat before photoshoots and holidays.	Sporadic before event
6.	Stan	26	Personal trainer		
7.	Linda	43	Personal trainer		
8.	Eve	50	Nurse advisor		One-off
9.	Judy	47	Manager	Decided to lose weight because had high blood	Sporadic

				pressure. Likes MyFitnessPal because it's in her phone with everything else. Has sweet tooth and would eat less during the day to be able to eat piece of chocolate later.	
10.	Audrey	45	Financial advisor	Describes herself as dieting for decades. Was not eating dairy and whey during out interview and was seeing a dietitian.	Sporadic
11.	Wilma	43	Police officer	Wants to fit back in her clothes. Meets with personal trainer once in a week.	Continuous for months
12.	Vijay	25	PG student	Started using to lose weight and stay fitter. Using made him learn that eating biscuits was impeding his weight loss. Has IBS so had limited diet.	Continuous for months
13.	Lilian	35	School admin	Avid MyFitnessPal user, who lost a lot of weight with its help. Enjoys social aspects of the app like groups and	Sporadic

				forums. Made friends there.	
				Her use affected family who also started eating healthier.	
14.	Emily	30	Teacher	Mother of two young children wants to lose baby weight. Aims for sustainable weight loss, and found that MyFitnessPal helped her.	Continuous for months
15.	Stephen	37	Manager	Started exercising with his father-in-law and decided to lose some weight. MyFitnessPal helped him to make lower-calorie choices. Now focuses on the strength in his boot camp training.	One-off
16.	Britany	32	University staff	Enthusiastic crossfitter who was a medical doctor earlier in her career. Aims to get all the required vitamins and minerals from food, so uses MyFitnessPal to track that and to make sure she eats enough calories.	Continuous for months
17.	Dom	40	English teacher	Teaches English abroad and therefore travels much. But	Continuous for months

				was based in the UK during weight loss period. Lost a lot of weight in a year running and using MyFitnessPal. Was not eating necessarily healthy foods, but simply tried not to go above the calorie goal.	
18.	Barney	22	Graduate student	Passionate cross fitter wanting to become professional. Used MyFitnessPal both to lose and gain weight.	Continuous for months
19.	Alex	28	UG student	Started using MyFitnessPal to lose weight and because housemates were users. Used very much on and off, and did not look for a healthy diet, but aimed to fit such choices as eating at Subway within calorie limit.	One-off
20.	Gemma	29	Sound engineer	First used MyFitnessPal to prepare for 10K run. Now aims to lose weight. Finds it motivating when friends are successfully using as well.	Sporadic

21.	Julie	28	Graphic designer	Was more successful at using when was a student and did it with friends. Now struggles, but finds MyFitnessPal useful to swap for healthier choices.	Sporadic
22.	Lars	31	Personal trainer/manager		
23.	Serge	41	Sound technician	Used MyFitnessPal on and off until decided to lose weight for his wedding. Also started running and going to the gym. Wife tells he's obsessed about sport and diet now. Says it was a lifestyle change.	One-off/Sporadic
24.	Anamaria	30	PG student	Started using when felt bad about the weight gain during long stay at home. Uses MyFitnessPal to track what she eats and says that never had a day off during her several months use. Learned from MyFitnessPal that she eats too much sugar (as her	Continuous for months

partner always told her) and too little protein (as her mother always insisted).

25.	Georgina	45	Gardner	Counted calories half of her life, not continuously but whenever needs to lose weight. Now uses MyFitnessPal to help her with that. Finds these short bursts of use helpful in losing weight.	Sporadic before events
26.	Samantha	23	PG student	Used MyFitnessPal when working at girls boarding school, where both girls and staff were using it. Wanted to understand how it works and why people use it. Found that girls were a bit too obsessed with it, and felt that after some use she was getting too much into as well.	One-off
27.	Joe	45	IT technician	Used MyFitnessPal to lose weight and successfully did that and maintained his muscle mass. His main goal	One-off

				is at 50 feel healthier than someone half his age.	
28.	Amy	36	E-learning Officer	Trains a lot at the gym and uses MyFitnessPal to lose weight. Finds calorie counting helpful, but still follows bodily cues and eats more when she thinks her body needs it.	Continuous for months
29.	Roy	30	Works at Vice-Chancellor's office	Used MyFitnessPal sporadically in order to control his eating. Finally found himself purging and was diagnosed with bulimia. Thinks that MyFitnessPal is a great tool, but in the wrong hands it could be detrimental.	Sporadic
30.	Justine	36	Works at Development and Alumni relations	Uses MyFitnessPal on and off to lose weight, especially before some event like holiday. Finds it hard to come back using if stops for few days.	Sporadic
31.	Ruth	31	PG Student/Lecturer	Uses MyFitnessPal very much on and off, sometimes	Sporadic

just few days in a week. But
finds that tracking food helps
her to eat 'healthier'. Learned
a lot about calories from the
app. 'Saves up' calories
during the day to be able to
drink wine in the evening.