Everyday Digital Self-Tracking Practices in China: Variations, Feelings, and Sharing

By

Xiufeng Jia

A thesis submitted in partial fulfilment of the requirements for the degree of
Doctor of Philosophy

The University of Sheffield
Faculty of Sociological Sciences
Department of Sociological Studies

Submission: March 2023

Abstract

This thesis explores what diverse digital self-tracking practices mean to people in their everyday lives in the Chinese context. It identifies some consistencies with the findings of Western self-tracking studies, and it also contributes to new empirical detail about Chinese digital self-tracking. Drawing on mixed qualitative and quantitative methods approach with semi-structured interviews (n=21) and semantic network analysis of 5,583 posts published on Sina Weibo, the analysis focuses on three main themes relating to tracking: variations; feelings; and sharing and communicating.

I found that Chinese people are driven by different motivations and selectively use functions of diverse self-tracking technologies to track physical activities and bodily metrics. Ways of self-tracking are shaped by variations in people's everyday lives, as well as Chinese medical, working, and food cultures, and the seasons and fluctuating environmental conditions across the year. As a result, an individual can track the same thing differently in these different contexts and different people track activities in different ways.

My participants had stronger feelings about weight and menstrual cycle data, and less strong feelings about heart rate and sleep data, and little feeling about physical exercise data. Not everyone expresses feelings about self-tracking, and the absence of feelings relates to some of the contextual factors mentioned above, as well as gender.

I also found that people share and communicate about self-tracking data both online and offline. On social media, sharing focuses on self-documentation of mundane life rather than on sharing data. Communication through sharing is used to maintain various types of *guanxi* – initiating and building relationships between people (e.g. family members, friends, colleagues). However, this can be connected to intimate surveillance, sometimes leading self-trackers to be reluctant to share.

These original empirical findings enrich debates about self-tracking and advance academic understanding of everyday engagement with digital self-tracking as a phenomenon beyond the Western context. They contribute to digital sociology, science and technology studies, and media and communication studies.

Keywords: digital self-tracking, everyday life, differences, feelings, sharing

Acknowledgements

The biggest thanks must go to the people who participated in this research. It was an honour and privilege that you patiently shared your experiences, feelings, and attitudes about self-tracking. Many thanks for spending your valuable time on having conversations with me. You made this research possible and meaningful.

I am incredibly grateful to my superb supervisors, Professor Helen Kennedy, and Dr Kate Weiner. You have both been extremely helpful for my research project over the past four years, providing thoughtful suggestions and feedback on my thesis. I have learned so much from your excellent work and professional abilities, as you are both intelligent, creative, kind, responsible and active. I appreciate that your senses of humour significantly lightened my supervisions and my PhD journey. Every word of encouragement from you gradually enhanced my confidence, as I often lacked confidence in my academic work.

Thank you to the Great Britain-China Educational Trust for offering a grant to support this project in the last stage of my PhD. Also, big thanks to the Department of Digital Humanities at KCL who have offered me a contracted job and the Department of Sociological Studies at the University of Sheffield who provided teaching opportunities. This PhD could not have been continued without being offered these opportunities so that I could enjoy salaries to support my study alone when I felt hopeless about my serious financial issues. Many thanks!

My thanks also go to my best friends in China and the UK who have continued supporting me in the process of completing this research. Yuanyuan and Taotao, who have been my best friends for 18 years, have cheered me up, shared nice life stories, and provided comfort. Xiaoyu and Zhijie, for supporting my research recruitment and data collection and enjoying a fun time together in Beijing. Thanks to my close friends, Monika, Chris, Ruth, Camille, Jiaxun and Lijiaozi; having our friendship was very precious during my PhD life and in my life in the UK. Thanks also to other PGRs and all staff in the Department of Sociological Studies, who offered me generous help during this academic journey. Big thanks should also be given to the proofreader James – my thesis was written with your excellent proofreading work smoothly!

I must say a huge thanks to my lovely family. Dad and mum, for fully respecting my every decision and supporting me to achieve my dreams over the years. Being your daughter is the luckiest thing that ever happened to me in my whole life. My wish is that you both stay healthy. Finally, I will be able to start to take care of you in return for all your love, after my PhD completion. My partner, Chris, for accompanying me for eight years, bringing the best life and the most happiness into my life, and staying by my side to explore interesting adventures in the world. My PhD could not have been completed without your full support, my love. I love you all. My life would lose colour without you all in it.

Declaration

I, Xiufeng Jia, confirm that the work presented in this thesis is my own. I am aware of the University's Guidance on the Use of Unfair Means (www.sheffield.ac.uk/ssid/unfair-means). This work has not been previously presented for an award at this, or any other, university. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

Contents

List of Tables

List of Figures

Chapter 1 Introduction

1.1 Introduction

Ordinary people's everyday lives have rapidly become digital data in China. It is no longer strange for Chinese people to conduct their diverse everyday activities using digital technologies such as WeRun on WeChat and self-tracking devices and apps. WeRun is a popular tracking fitness plugin that is built-in to the Chinese social media mobile application WeChat. It is embedded into people's existing social networks, and its official public account is integrated into the app (Gui et al., 2017). Chen and co-authors (2018) call WeChat a 'super app', noting that "'leaving WeChat means leaving [social] life' in China" (p.6). The popularity of WeChat draws Chinese people to engage with WeRun in their everyday lives. People allow it to automatically monitor their daily step counts to stay physically healthy and active and to develop social relationships within existing networks through communication about each other's daily steps (Gui et al., 2017). People also widely use wearable devices (such as the Mi wristband, Apple Watch, Huawei Watch and wristband, and Imo+ Wrist Ring) in China and use tracking mobile applications (such as Mi Fitness, Huawei Health, Keep, Nike Training, JoyRun, Yodo Run, Food Storehouse, iCalories, Myrunner, and Meetyou) (Lu et al., 2021b; Nie et al., 2016; Wang et al., 2019; Xu, 2020; Yu, 2017). Previous studies demonstrate that the large number of devices and apps on the Chinese market are used across various domains in China to track physical activities, food consumption, diet, menstruation cycles, sleep and much more.

However, digital self-tracking phenomenon has received little sociological attention in countries like China. Although in recent years researchers have started to develop self-tracking studies in Chinese contexts, they tend to focus on developing better strategies for the design of self-tracking technologies, and they emerge from human-computer interactions, informatics, marketing studies, and medical science studies. In a study based on human-computer interactions, researchers emphasise the benefits of self-tracking technologies for behavioural changes (Lu et al., 2021b). In business studies, Chinese researchers have highlighted the impacts of using digital self-tracking technologies on users' behaviours, attitudes, continuous intentions, and experiences, seeking to identify how to improve sustained usage and design of technologies (Cho et al., 2020; Lu et al., 2021a; Yin et al., 2022; Zhang and Xu, 2020; Zhao et al., 2019). Some research projects have examined the health aspects of these technologies, from a medical or psychological perspective (Gao et al., 2017; Huang et al., 2018; Jiang et al., 2021). Researchers in clinical and medical studies have highlighted the medical applications of self-tracking technologies for patients' diabetes management and clinicians' recommendations of app selection for patients – such findings aim to lead to improvements in the design of diabetes trackers (Gao et al., 2017; Huang et al., 2018). These studies focus on the use and influences of self-tracking technologies for commercial and medical purposes. They rarely look closely at ordinary people's everyday engagements with self-tracking and self-tracking data in their personal lives, family lives, in

the workplace, and in their social relationships. In other words, there is a lack of sociological enquiry into self-tracking studies in China.

Sociological investigations into living with self-tracking data have mostly been carried out in the West, where, in recent years, the research focus has shifted from an elite self-tracking community known as the 'quantified self' (QS) community to everyday self-tracking. Self-tracking has attracted the attention of academic researchers across the social sciences, especially in critical data studies and sociological studies. Some of these researchers critique how power dynamics in digital self-tracking data are overemphasised (Kennedy, 2018; Sharon and Zandbergen, 2017). Instead, they argue that the social and cultural aspects of self-tracking and related data should be explored. Some scholars argue that data are meaningful for individuals in their social, communicational, and emotional aspects of everyday practices (Kennedy, 2018; Lupton, 2017d; Pink et al., 2017; Sharon and Zandbergen, 2017; Weiner et al., 2020). In a review of existing self-tracking literature in *Digital Media and Participatory Cultures of Health and Illness* (2021), Stefania Vicari points out that data have different meanings for different self-trackers in everyday digital health. These issues and considerations are rarely the focus of self-tracking research that takes place in China.

Therefore, there is a research gap to be filled regarding how Chinese self-trackers live with and make sense of their data from a sociological perspective. In a study about the mobile app walkthrough method, Ben Light and his co-authors (2018) argue that cultural meanings are embedded in people's everyday uses of software applications, such as Clue, a period tracker app. They point out a mutual shaping between a culture and the design and development of applications that are influenced by it; in turn they shape and reinforce cultural values among ordinary users. Although such research was an app-centred study, it inspires the present research project to conduct a user-centred study to investigate how ordinary people appropriate and resist self-tracking applications and their data in everyday life.

Many scholars argue that a focus on individuals is a crucial for understanding day-to-day data practices (Kennedy, 2018; Pantzar and Ruckenstein, 2017; Pink et al., 2017; Ruckenstein and Schüll, 2017). Some scholars (Kennedy, 2016; Ruckenstein and Schüll, 2017) have drawn attention to everyday engagement with data. Particularly, some self-tracking scholars (Fiore-Gartland and Neff, 2015; Pantzar and Ruckenstein, 2017; Weiner et al., 2020) emphasise the importance of researching whether self-tracking data are meaningful for individuals in relation to their thoughts and feelings about data and experiences of everyday living with data. Kennedy (2018) also notes that researching ordinary people's everyday engagement with self-tracking data can contribute to understanding the new ways in which people live with data. Additionally, sharing self-tracking data on social media platforms is an important phenomenon that can teach much about people's understanding of their own personal data (Kent, 2020b; Lomborg and Frandsen, 2016).

The present project joins these existing studies of everyday self-tracking of ordinary people, taking an everyday life approach to explore the topic in the Chinese context. It aims to explore differences in the digital self-tracking data practices of ordinary Chinese individuals, their feelings about their self-tracking data, and how they share and communicate through

self-tracking data. This project is inspired by scholars' work in everyday data practices, particularly by Kate Weiner, Helen Kennedy, Sarah Pink, Minna Ruckenstein, and Deborah Lupton. Their studies highlight the meanings of data in everyday life, including emotional, embodied, and communicative responses towards self-tracking data. My research is built upon their and other self-tracking scholars' work to develop this topic in the Chinese context.

1.2 Research Context

Several self-tracking scholars have conceptualised self-tracking and investigated meanings of digital self-tracking technologies and data from different perspectives. Their studies have gradually shifted attention from a self-tracking community to individual self-trackers in everyday life (Pink and Fors, 2017a; Ruckenstein, 2014; Weiner et al., 2020). Self-tracking scholarship has focused on personal, societal, and cultural aspects of everyday self-tracking data practices to understand the digital self-tracking phenomenon.

This thesis empirically explores what self-tracking means to Chinese people in their everyday lives in the context of contemporary China. To achieve this research aim, the thesis examines variations in self-tracking data practices from a sociological perspective, explores feelings about different types of self-tracking and related data, and investigates whether and how self-trackers share their data. It also attempts to discover theoretical debates in a comparison of self-tracking studies between Chinese and Western literature and explores whether there are similarities and differences in the self-tracking practices observed in China. The overarching research question is:

- What do self-tracking practices and self-tracking data mean to ordinary people in China?

By analysing interview data and social media data, the study aims to answer four sub-questions:

RQ1: What differences matter in Chinese self-trackers' tracking activities?

RQ2: How do Chinese self-trackers feel about their different self-tracking practices and data?

RQ3: How do Chinese self-trackers share and communicate about their self-tracking practices? What do they share and communicate?

RQ4: Do themes identified in the literature review apply in the Chinese context, or do new themes emerge? How do the findings relate to current scholarship?

The core concept in this study is digital self-tracking, characterised by its activities, technologies, data practices, feelings about digital self-tracking practices, and sharing practices. Self-tracking studies have a history of discovering how people have traditionally self-monitored their bodies and lives for centuries, by using pen and paper, photos,

spreadsheets, and journals (Crawford et al., 2015; Lupton, 2016a; Lupton and Smith, 2018). In this data-driven age, self-tracking is digitalised and datafied by digital self-tracking technologies. These are the latter-day versions of traditional tracking methods (Lupton, 2016a). Digital self-tracking technologies have functions to assist in monitoring bodily conditions, health conditions, emotions and moods, sexual lives, lifestyles, physical activities, expenses, and work productivity. Lupton (2016b) suggests that, compared with traditional self-tracking tools, digital technologies have enabled people to produce more detailed data for self-measurement and self-monitoring of their bodies, ordinary life routines, behaviours and activities, and to assist in the analysis, visualisation and sharing of self-tracking data.

As digital self-tracking technologies have developed, the importance of digital self-tracking data has been recognised by journalists. One prominent example is Gary Wolf, who introduces the term Quantified Self (QS) in his articles and official QS website and organises the QS movement and QS communities. The Quantified Self means that people use digital technologies to measure diverse aspects of their bodies and lives and convert measured results into visible and transparent personal data (Nafus and Sherman, 2014). QS self-trackers such as Wolf (2010; 2009) and McClusky (2009), identify QS tracking as "self-knowledge through data". They explain that people collect, own, analyse and understand their personal data, and that they collect detailed knowledge about their bodies, health situations, lives, and well-being through self-tracking data, for self-improvement, and the achievement of better lives and the 'best self'.

With the growth in development of such technologies, digital self-tracking studies have shifted from the QS community to a broader study of everyday life. Researchers have used various concepts from cultural studies, media studies, and sociological studies to refer to digital self-tracking in everyday life, such as 'everyday self-tracking' (Lupton and Smith, 2018; Pink and Fors, 2017a), 'mundane self-tracking' (Didžiokaitė et al., 2018b), or 'everyday/mundane self-monitoring' (Weiner et al., 2020). Researchers use these terms to highlight how individuals engage with digital self-tracking in everyday life. I use these terms interchangeably throughout this thesis to refer to digital self-tracking in everyday life.

Self-trackers produce data through digital technologies and their systems, sharing, and social practices. Lupton (2016c) suggests that self-tracking data practices have become a type of active digital personal data collection where people voluntarily selectively collect data and make use of it to benefit themselves. Data are collected and represented not only quantitatively (so-called quantified self-tracking data) but also qualitatively through text and images (Lupton, 2016b), such as health-related information recommended by the technologies. People engage with digital self-tracking data practices by measuring, collecting, analysing, reviewing, and circulating data (Weiner et al., 2020). Many people carry trackers around in their everyday lives and continually produce massive amounts of data, as their devices and apps have built-in sensors and are connected to the Internet (Lupton, 2016c). People also manually input information into the technological systems to update them about their lives and selves. Their recorded data are algorithmically analysed, visualised, and stored in their devices and apps (Lupton, 2017d; Rich and Miah, 2017; Weiner et al., 2020). Self-trackers are encouraged by the social media functions of the technologies to share their

personal self-tracking data to other digital platforms (Gui et al., 2017; Kent, 2018; Light et al., 2018; Lupton, 2017d), although not everyone is keen to share publicly online (Weiner et al., 2020). Therefore, digital self-tracking data practices involve data measurement, collection, representation, storage, reviewing, sharing and communication (Lomborg and Frandsen, 2016; Weiner et al., 2020).

Within previous studies, the concept of digital self-tracking is defined from different perspectives. Some researchers (Kent, 2021) identify digital self-tracking as self-disciplining, self-management and self-care. Others consider it to be datafied health through which individuals' bodily states are transformed into quantified data (Pantzar and Ruckenstein, 2017; Van Dijck and Poell, 2016). Digital self-tracking has also been described in terms of self-narratives and identity construction (Kent, 2018; Lupton, 2016c; Rettberg, 2014). Digital self-tracking is also a method of communication (Lomborg and Frandsen, 2016; Pink and Fors, 2017b). These definitions suggest that digital self-tracking is strongly embedded in the social and cultural dimensions of everyday life. I understand digital self-tracking in this thesis as a continuation of traditional self-monitoring methods but involving the intersections between the more complex algorithmic process of technologies, data practices, the self and everyday life.

Responding to the research gap on the diversity of self-tracking practices and recognising the importance of this for better understanding everyday self-tracking, the first research question investigates variations in self-tracking practices. With the growth in availability of digital self-tracking technologies, a range of different types of devices and apps have become available to ordinary people and have been studied in the existing literature. Self-tracking technologies can be used to track physical exercise such as walking, running and cycling through use of technology such as Jawbone, Fitbit, Nike+, Apple Watch, Strava, Endomondo, and Garmin Connect (Lomborg and Frandsen, 2016; Lupton, 2016c; Pink and Fors, 2017a). Many studies focus on tracking bodily features such as weight through Weight Watchers, Fitbit or MyFitnessPal apps (Lupton and Smith, 2018; Weiner et al., 2020), heart rate via Polar Electro (Pantzar and Ruckenstein, 2015), and menstruation cycles via Clue and Flo apps (Kressbach, 2021). Tracking lifestyles with bodily metrics has also been commonly discussed in the literature, such as food consumption and calorie intake on the MyFitnessPal app (Didžiokaitė et al., 2018a) and sleep through Jawbone Up3 (Elmholdt et al., 2021). It is rare to see research about the use of such technologies, or of Chinese self-tracking devices and apps, in China. As mentioned above, there are multiple Chinese self-tracking technologies, including WeRun on WeChat, Keep, and Huawei Health apps. These technologies often interact with Chinese social media platforms like Sina Weibo and WeChat (Cho et al., 2020; Gui et al., 2017) where people can share their self-tracking data and experiences. These have not been studied to the extent that self-tracking technologies developed in the West have.

As can be seen from the literature referenced above, different self-tracking studies have drawn attention to different self-tracking practices. These include tracking bodies and lifestyles, bodily conditions and chronic health states. Lupton has researched the tracking of sexual life (Lupton, 2015) and cycling activity (Lupton et al., 2018), while Weiner and her

co-researchers (Weiner et al., 2017; Weiner et al., 2020) investigate the tracking of blood pressure, weight and body mass index (BMI). Other studies have found that some self-trackers monitor multiple things at the same time or use more than one device/app (Didžiokaitė et al., 2018b; Lu et al., 2021b). Yet despite the diversity of self-tracking practices that people engage in, few scholars have compared diverse digital self-tracking practices within one study. To address this gap, this thesis considers a range of everyday self-tracking activities to present a relatively more complete picture of diverse self-tracking practices. It is important to explore what types of data, activity and devices people engage with, how their experiences, concerns, backgrounds, levels of knowledge and skills shape their self-tracking practices, and how differently they use and make sense of self-tracking and related data (Kennedy et al., 2020). Therefore, my first research question asks *what differences matter in Chinese self-trackers tracking activities?* Studying different self-tracking data practices together will contribute to understanding how different individuals make sense of different self-tracking data and practices in different contexts.

People's feelings are intertwined with these aspects of digital self-tracking practices. Their emotions, bodily sensations, and sensory responses reflect the relationships between technologies, data, and bodies. Researchers suggest that assessments of physical and emotional feeling aspects of digital self-tracking can provide insight into people's values, understandings and interpretation of using the technologies and data, and help to develop self-awareness of their bodies through these feelings (Kent, 2020b; Lupton et al., 2018; Nafus and Sherman, 2014; Sharon and Zandbergen, 2017; Weiner et al., 2020).

Feelings about data is one key theme that emerges in the literature that seeks to understand how self-trackers negotiate digital self-tracking technologies, data and data visualisations, and the self (Kennedy and Hill, 2018; Lupton, 2017b; Pantzar and Ruckenstein, 2015; Ruckenstein, 2014; Weiner et al., 2020). Scholars have discussed emotional responses towards data, physical sensory engagement with data, and the relationship between bodily sensations and data (e.g. Lomborg and Frandsen, 2016; Nafus and Sherman, 2014; Pink et al., 2017). Feelings are mostly discussed in relation to one type of self-tracking data practices. And yet, according to Kennedy (2020), different people engage with different types of data in different ways within different contexts. Existing self-tracking studies sometimes generalise conclusions regarding feelings about one type of self-tracking to other types of self-tracking data. For example, Lupton and her co-researchers (Lupton et al., 2018) develop conclusions about feelings about tracking cycling activities but some specific feelings can only happen in the context of cycling. They suggest that people understand their self-tracking data by combing it with bodily feelings when riding bikes or in dangerous cycling conditions. However, tracking weight could not involve these types of bodily feelings. To avoid such broad conclusions, my research explores feelings across diverse types of self-tracking in the Chinese context. This relates to the second research question: *how do Chinese self-trackers feel about their different self-tracking practices and data?*

Another key theme that emerges in self-tracking literature is the importance of sharing and communicating about data. Devices and apps are designed to allow people to connect with other digital technologies and people (Light et al., 2018). Self-trackers communicate about

their data with others using such technologies and social media like Instagram and Facebook (Enli and Thumim, 2012; Kent, 2020b; Lomborg and Frandsen, 2016). However, sharing practices are often more complicated than ideal ways of sharing data as developers and companies expect. Researchers have pointed out that self-trackers might socially interact with others by sharing the data in public (Fiore-Gartland and Neff, 2015; Kent, 2018; Pink and Fors, 2017b; Sharon and Zandbergen, 2017; Weiner et al., 2020). Literature looking at the sharing of self-tracking data suggests that ways of sharing data include on social media, within groups on WhatsApp, or privately at home, and that self-trackers share data with various people in their lives (Kent, 2020b; Lomborg and Frandsen, 2016; Rettberg, 2017; Weiner et al., 2020). Within sharing data practices, healthy identities have emerged in the scholarship. The third research question is: *how do Chinese self-trackers share and communicate about their self-tracking practices? What do they share and communicate?* The thesis examines what, whether, and how Chinese self-trackers share their self-tracking practices and data on Chinese social media, in different online forms, privately, or offline.

1.3 The Chinese Context

Digital self-tracking has drawn attention from Chinese national policy makers who exploit its potential for dealing with people's health-related issues. With the support of national health policies, a range of types of self-tracking technologies are booming in the Chinese market and attracting Chinese people to use them for health promotion and improvement of their lives. More discussion about everyday engagement with wearable devices and mobile applications in everyday life in China will be presented in the later empirical chapters.

1.3.1 Digital self-tracking and Chinese governmental health policies

With the acceleration of the aging process in China and the growing burden of chronic diseases, the Chinese government has set a goal of 'Healthy China 2030' that encourages development of digital health, by shifting from a reliance on the public health system to social participation in national health development (Jingwen, 2022). On the China Daily News official website, journalist Jingwen (2022) reports that national policies advocate individual responsibility for health and illness management in their everyday lives, and a premise for this is the widespread use of digital technology such as self-tracking wearable devices and mobile applications. Therefore, the trend towards the growth, development and adoption of self-tracking technologies is related to health policies and relevant strategies created by the Chinese national government.

According to the United Nations' Chinese sustainable development goals from 2021 to 2025 (UNChina, 2016), the third goal is "Good Health and Well-being" to ensure that all Chinese population live healthily and promote positive well-being. To encourage Chinese people to live a healthy life, the National Health Commissions of the People's Republic of China

(NHC) and the Chinese Disease Control and Prevention Centre cooperated to start a national movement called 'National Healthy Lifestyle Day' on 1st September every year since 2007 (NHC, 2007). The Chinese State Council (CSC) (2022) suggests that this movement aims to advocate the idea of being healthy as self-responsibility, to increase the health awareness of citizens, and to improve their health literacy. For example, the theme of the movement in 2022 encouraged people to reduce their consumption of salt, sugar and oil and to change unhealthy lifestyles, as overindulging in such food can lead to chronic diseases such as hypertension, hyperglycaemia, and hyperlipidaemia (NHC, 2018). Health-related guidance and knowledge in relation to self-tracking of health in annual movements contributes to comprehensively promoting the construction of a healthy China (CSC, 2022a). This demonstrates governmental strategies that encourage Chinese individuals to take responsibility for staying in 'good' health. Personal self-tracking technologies and practices are considered to be part of state strategies for health in China.

The Chinese national government highlights the importance of self-tracking for developing individual responsibility for healthy lifestyles and prevention of chronic diseases. In an outline of health in China for 2023, the Chinese State Council (CSC, 2016) listed strategies to develop citizens' health, such as promotion of self-disciplined healthy behaviours from diet to physical exercise, improvement of health monitoring systems, and development of health monitoring big data and self-tracking technologies. To achieve the state health plan in 2030, the Chinese State Council (CSC, 2022b) released the 14th five-year health plan. It emphasises two points in relation to digital self-tracking: digital health management should be integrated into people's mundane lives; and new information technology (AI and big data) should be promoted for personal health real-time self-tracking practices and other health-related aspects. With national policy support, citizens are not only encouraged to participate in everyday digital self-tracking for self-care and health self-management, but self-tracking technologies are also being developed as a key market in modern day China.

1.3.2 Development and use of self-tracking technologies in China and the West

Massive digital self-tracking technologies have been developed by local technology companies in China, and some are even used in foreign countries. Domestic devices and mobile applications are often more popular in China than other countries' products, while some Western self-tracking technologies are accessible to Chinese users in China. Development of these devices and apps in China signals that many Chinese people use them in their daily lives, thus sociological research is required to learn more about this topic.

Industrial reports show that Chinese self-tracking technologies are thriving in Chinese and the global industries, and some leading Chinese self-tracking technologies are world leaders. Industry researcher Shi (2021) suggested that by September 2021 the largest global source of technology for smart watches would be China, accounting for 77.62% of global smart watch patent applications, followed by the USA. Since the COVID-19 pandemic, Chinese users of Huawei trackers to monitor at least one bodily metric or activity in everyday life have

occupied the highest percentage of tracking with 44%, compared with users in other countries (including Germany, France, Italy, UK and USA) (Schneider and Arnold, 2022). In a report on the Chinese smart wearable device industry, Zhang (2021) suggests that the three most popular technology companies – Huawei, Mi and Apple – would develop a series of self-tracking products in China for exercise and entertainment. She reports that with the development of the Chinese mobile Internet, the market size of China's smart wearable device industry grew from 11.48 billion yuan in 2015 to 63.22 billion yuan in 2020, and has been predicted to reach 128.51 billion yuan by 2024. As such, many Chinese devices and apps are increasingly being used in China, and some are even popular in Western countries. Wang and others (2022) from the International Data Corporation (IDC) also suggest self-tracking technology in China for tracking health-related parameters is gradually improving, particularly for blood pressure and body fat, and more bodily metrics may be trackable in the future. They also predict that shipments of adult smart watches will grow 3.5% in 2023 and demand for these products will increase because of renewed possibilities for outdoor exercise and personal travel after the peak of COVID-19 pandemic.

Recent research into the use of Huawei's self-tracking products in six countries since the pandemic begin in 2020 was conducted by the Huawei company itself (Schneider and Arnold, 2022). It suggests that each of 18,000 research participants tracked four or five bodily metrics and/or activity parameters on average. Chinese users who started to use such technologies increased 29% due to COVID-19, increasing at a higher rate than in other countries. Huawei's report shows that the most popular things that participants track include physical exercise, heart rate and calories, while sleep and professional physical exercise are less important to users. They also found that people in different socioeconomic statuses all increased time spent on exercise when they used tracking functions (Schneider and Arnold, 2022). These findings show that popular Chinese devices and apps such as Huawei's self-tracking products are widely used in China and other countries, but they are rarely studied in Western self-tracking scholarship.

Research statistics released by Statista demonstrate the use of specific popular Chinese self-tracking technologies in many countries including China. For example, Figure 1.1 shows that in September 2022, the two most-downloaded Chinese apps were the Huawei Health and the Blood Pressure Pro apps, which ranked second (with 3.04 million global downloads) and sixth (1.45 million global downloads) respectively. The third-ranked app, Sweatcoin, was made in the UK, followed by two apps made in the US (Statista, 2022). Its follow-up report shows that in 2022 the Chinese Blood Pressure Pro app ranked as the second most-downloaded app worldwide with 51 million downloads, based on number of overall global downloads in both iOS and Google Play (excluding data for Google Play in China) (Statista, 2023). Many Chinese self-tracking apps with a high number of worldwide downloads seem to be well-known among the public but draw little attention in academic literature. Thus, sociological research on how self-trackers use such apps in everyday life requires attention. Besides the most popular apps, it is important to explore other apps which are used daily in China but have been seldom discussed in the industrial reports and academic work so far.

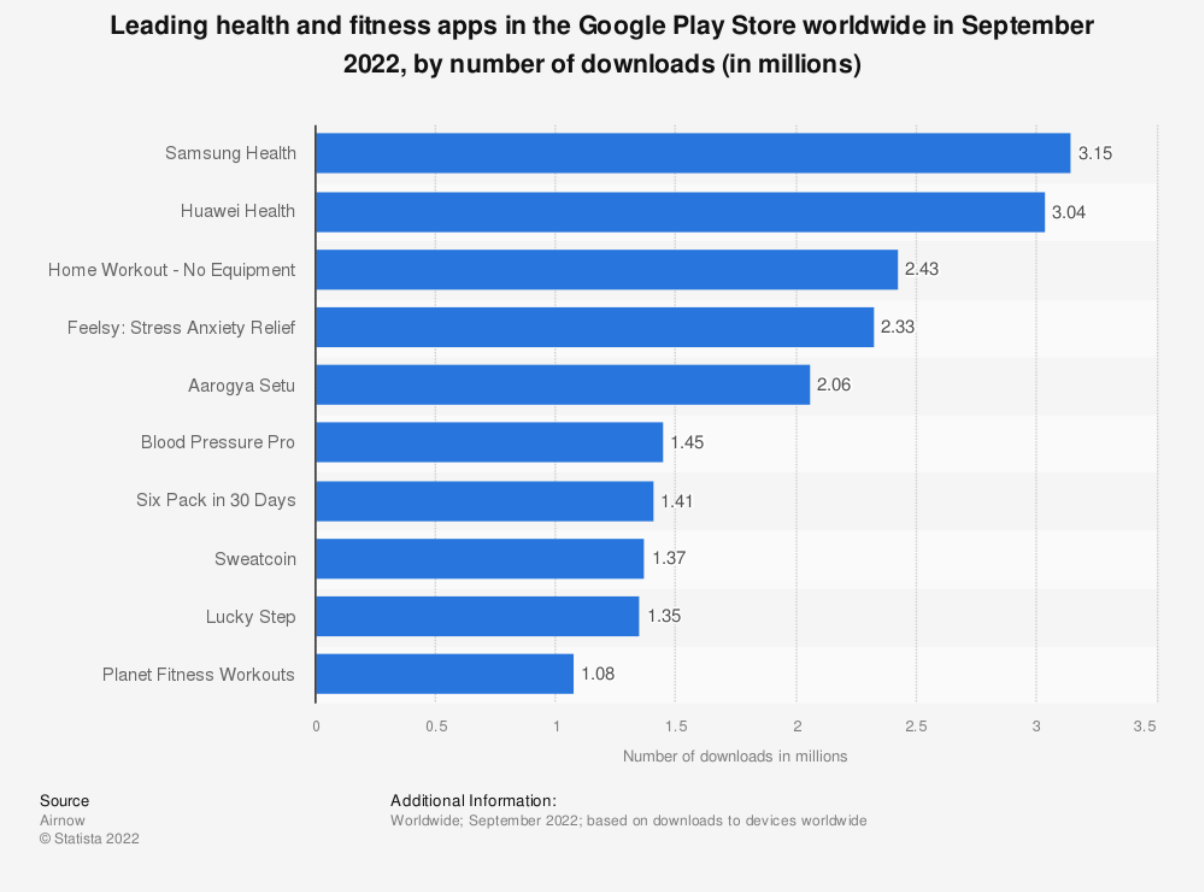


Figure 1.1: Top ten most globally downloaded apps in September 2022 in the Health and Fitness category in the Google Play Store (Statista, 2022)

Some Western self-tracking technologies in Chinese app stores (such as Huawei AppGallery, Tencent Appstore, 360, Xiaomi, and Apple store) are also accessible in China and some have become popular, although apps in the Google App Store are blocked in China (Lu et al., 2021a). Due to the Chinese government's restrictions and social media regulations of Western mobile applications, previous studies have noted that foreign social media platforms (including Facebook, Instagram, Twitter and YouTube) and search engines (Google) are unavailable for people in China (Harwit, 2017; Keane, 2016; Plantin and De Seta, 2019). A comparison of features of popular Chinese and Western food tracking apps in the Apple App Store suggests that all interview participants used Chinese apps for tracking food consumption and relevant metrics (Lu et al., 2021a).

However, a few foreign apps are used by Chinese people. In a study of popular gamified fitness tracking apps with high download frequency in the Chinese iTunes Store reveals that a foreign app named Dojo (previously known as WalkUp) is popular in China (Tu et al., 2019). There are other Western devices and apps that Chinese people use in China and Hong Kong, such as Nike Training (Zhang and Xu, 2020), Apple Health, Samsung Health, My Fitness Pal, and NIKE+ Run Club (Cho et al., 2020), Runkeeper, MapMyRun, and Runtastic (Slotta, 2022a).

In short, self-tracking technologies in China are being increasingly developed and showing a positive future trend. Although the governmental national policies emphasise the health benefits of such technologies, industrial reports and academic work illustrate that people use them for lifestyle development, entertainment practices, and life services beyond health purposes. Although the existing self-tracking scholarship largely discusses Western self-tracking technologies, Chinese self-tracking technologies are developing rapidly but have received less attention from scholars. Besides, people in China use some Western devices and apps, particularly well-known brands such as Garmin, Apple, and Samsung, but little is known about how they use them in the Chinese societal and cultural context. Therefore, the large scale of development and use of such technologies in China calls for sociological studies into individuals' everyday living with devices and apps and their personal self-tracking data in the Chinese context. It is also prudent to learn about little-known devices and apps used in China, which have been not discussed in the literature. The present research contributes to a better understanding of the diversity of self-tracking practices. The next section will discuss self-tracking mobile applications and everyday lives in China.

1.3.3 Digital self-tracking technologies and everyday life in China

The adoption of mobile applications has blended into mundane life and been treated as an important part of Chinese people's daily lives. Both self-tracking apps and wearable devices with their own bespoke mobile apps are available in app stores, and devices and their accompanying apps operate interdependently. For example, an online survey with 3,791 Chinese wearable devices users reports that 62% of respondents in China connect their wearable devices to fitness apps, and some young users connect them to their mobile payment apps (Slotta, 2022a; 2022b). The inseparability between wearable devices and mobile applications suggests that self-tracking practices are embedded into software applications. This illustration highlights the embeddedness of self-tracking technologies into everyday life in China, a phenomenon that is worth studying in more detail.

Mobile applications including self-tracking apps are used in many individuals' daily lives in China. In a study of the popularity of different types of mobile applications in global markets, Tao and Edmunds (2018) suggest that the largest market for global mobile applications is in China. According to the China Internet Network Information Centre (CNNIC) (2022b), research suggests that there were 1,029 million Chinese mobile Internet users and 2,52 million mobile apps available on the Chinese market in December 2021. Thomala researched the average amount of time spent on mobile apps daily and found that during September 2022 Chinese mobile users spent an average of 7.5 hours per day using apps (Thomala, 2022), and they used them for an average of 5.3 hours every day in the last quarter of 2022 (Thomala, 2023a). These industrial reports provide an overview of various types of apps that people often spend a significant amount of time on in China, including instant messaging, short video, food delivery, travel booking, shopping, payment, and medical apps (CNNIC, 2022a; Thomala, 2022, 2023a, b). Thus, Chinese mobile users treat mobile apps as a key part of

organising and tracking their everyday lives, making them an important part of their daily routines.

Self-tracking mobile applications are also incorporated into individuals' mundane life routines such as life and health management, study, and entertainment. In China self-tracking technologies from local and foreign companies are being increasingly adopted. Recent reports show a tendency for digital self-tracking technologies to be widely used, marking a growing trend in daily usage. For example, a report of monthly active users of popular fitness mobile apps in China in June 2022 by Thomala (2023c) shows that the Keep app had 27.5 million monthly active users. The scale of development and adoption of such technologies demonstrate that they are increasingly being embedded in Chinese individuals' quotidian lives.

The everyday life approach that is adopted in this project allows the study of individual self-trackers' day-to-day experiences of engagement with digital self-tracking technologies and data, and to capture their personal everyday encounters and interactions with the technologies and data. It takes Chinese self-trackers' daily lives seriously through a lens of everyday life to discover unknown personal everyday experiences in sociological studies. There has been a call to take mundane everyday things seriously (Back, 2020). Investigation of everyday life allows for an understanding of individuals' perceptions, experiences, attitudes, feelings, and social interactions, which are all embedded in everyday life at a micro level (Adler et al., 1987b). As such, the everydayness of digital self-tracking enables the uncovering of people's practical everyday encounters with devices and apps, data practices (methods of personal data collection as well as interpretation of meanings of the data), and communication among intimate and social relationships.

It has been observed that people's mundane activities are configured and converted into data through applications and other digital technologies, and the data in turn flows back into their daily lives (Burgess et al., 2022). Digital self-tracking technologies and their data are ubiquitous but integral parts of everyday activities (Lyall and Robards, 2018; Pink and Fors, 2017a). Their embeddedness is inseparable from the ordinary activities of a diverse range of people. Thus, a sociological exploration of mundane subjective experiences of Chinese individuals can help to represent unseen and unspoken aspects of what people think, feel about and do with self-tracking technologies and their data. Chinese health policy makers and industrial reports about the positive technological development tend to celebrate the potential successes of such technologies without concern for how they affect individual daily users.

These everyday aspects of self-tracking are not only interwoven into everyday life but are also embedded in the cultural environment. Focusing on everyday life contributes to studies of mundane lives in different cultures that shape people's lives (Kalekin-Fishman, 2013; Williams, 1958). Lomborg and Frandsen (2016), in a discussion on the meaning of self-tracking, conceptualise it as "a cultural and social practice" (p.1016). They note that self-tracking practices are integrated with the cultural forms of everyday life. Therefore, it is crucial to study the everyday to understand what happens when self-tracking technologies and data are brought into Chinese culture and people's everyday lives. People's everyday

experiences are rich and complex and should not be reduced to simple algorithms on devices, apps (Scrinis, 2020), and data (Sharon, 2017). Chinese self-tracking studies fail to develop a sociological understanding of how people live with self-tracking technologies and data in everyday life in China. Little is known about the relationship between Chinese individuals' diverse everyday daily routines and meanings of self-tracking. The intention of this study is to emphasise matters of everyday lives of Chinese self-trackers, and how the everydayness of self-tracking in Chinese cultures can differ from Western culture. Two main Chinese cultural contexts will be discussed in the final section of the literature review chapter.

To sum up, this section provides highlights the significance of researching digital self-tracking in the Chinese context. It recognises the self-tracking phenomenon in relation to national governmental health policies, technological development, and the sociological everydayness of personal tracking. These are all situated within cultural contexts in China. Thus, a timely sociological enquiry into self-trackers' mundane engagement with self-tracking devices and apps and their data in China is called for.

1.4 The Study

This thesis explores self-tracking experiences, feelings and attitudes of Chinese self-trackers. I carried out initial interviews with 21 Chinese self-trackers and repeat interviews with 10 of them. It also analysed 5,123 social media posts that related to diverse forms of self-tracking on Sina Weibo. Each semi-structured interview lasted for one hour on average, both in person and virtually via the WeChat application (due to COVID-19 restrictions in China). Interview participants were between 20 and 48 years old. Primarily, the research aimed to understand the meaning of self-tracking data for people in their everyday lives. To address this research aim, an interview schedule was designed and tested in a pilot study with two interviewees. The participants not only talked about how they made sense of self-tracking data but also often mentioned what the devices, apps and participatory activities meant to them in their daily lives. The pilot showed that while researchers are interested in data, people do not often think carefully about it. Therefore, besides focusing on data, the overarching research objective extended to self-tracking more broadly so that individual experiences of using data and technologies and life experiences could also be included. Interview questions were revised to meet the overarching research aim.

The second aim is to discover the meaning of self-tracking through looking at what and how self-trackers share self-tracking data. In the process of conducting interviews, participants said that they rarely shared things in relation to self-tracking to their social media accounts. They preferred to share with people who they were close to in person. This gave extra impetus for exploring the sharing of self-tracking data both online and offline. Chinese social media platform Sina Weibo was chosen as a field for data collection. I experimented and identified a set of research queries. I conducted a pilot study testing the accuracy of data collection with a web crawler until it was able to gather the online content that I had identified. After data collection, I used semantic network analysis to qualitatively and

quantitatively analyse Weibo posts and identified themes to address the third research question.

1.5 Thesis Outline

Following this introductory chapter, Chapter Two provides a review of the existing literature on self-tracking and is divided into five sections. Following an introduction, section 2.2: History of Self-Tracking Research explores research developments from Quantified Self-tracking to everyday self-tracking. This provides an overall research context for understanding what self-tracking is and how this study arrived at its overarching research aim. Section 2.3: Feelings About Self-Tracking starts with definitions of feelings that self-tracking scholars have discussed and then moves to an overview of literature on feelings about self-tracking, which has emerged mainly in the West. This literature explores how people feel about self-tracking data and meanings of data expressed in their feelings. Section 2.4: Sharing and Communicating about Self-Tracking summarises literature about sharing self-tracking data as forms of communication and online identity construction. Finally, section 2.5: Researching Self-tracking in China summarises existing research and outlines the research gaps around self-tracking in China.

Chapter Three is a methodological chapter that describes research design and methods chosen for this study. Section 3.2 briefly outlines the research aims and questions. Section 3.3: Qualitative and Quantitative Research Approaches justifies the rationale of a mixed methods approach by discussing each method's strengths and limitations. Section 3.4: Interviews and section 3.5: Social Media Text Mining describe what each method is and why they suit this study. These sections explain the data collection and data analysis of each method in a step-by-step process. Section 3.6: Ethical Considerations discusses the ethical issues involved in conducting this research online and face-to-face. The chapter concludes with a moment of self-reflection.

Chapter Four is the first empirical chapter. It provides an overview of self-tracking devices and apps and their features that participants referred to in interviews and which social media users mentioned in their posts. Section 4.2: What Participants Track summarises the devices and apps participants use and what activities they track using this technology. Section 4.3: Motivations discusses self-tracking motivations.

Chapter Five focuses on the differences that exist in digital self-tracking practices. Section 5.2: Different Lives, Different Self-tracking Practices begins with a consideration of the relationship between differences in self-tracking and three aspects of individuals' everyday lives: work lives, domestic life, and personal daily schedules. Section 5.3: Different Uses and Awareness of Features, Devices and Apps, and Data: Notifications, Goal Setting, Gamification and Other Tracking Functions explores how people use features, devices and apps differently. Section 5.4: Different Contexts investigates different contexts of self-

tracking practices in terms of seasonal changes and some of the specificities of Chinese culture.

Chapter Six discusses feelings about self-tracking data and technologies. Section 6.2: Feelings About Diverse Types of Data and Data Visualisations examines narratives of self-trackers which reveal different feelings about their self-tracking data. It suggests that people express stronger feelings about data in relation to weight, menstruation cycle and heart rate compared to data resulting from other types of self-tracking. Section 6.3: Feelings About Features of Devices and Apps turns to discuss feelings related to aspects of self-tracking beyond data. Section 6.4: No Feeling discusses the absence of feelings about self-tracking for some participants.

Chapter Seven addresses sharing self-tracking data as forms of communication and identity representation online. Section 7.2: I Share My Life, Not My Data discusses sharing data as a way of documenting everyday life. Section 6.4: Different Online Identity Constructions Through Sharing Data develops arguments around self-representation in sharing self-tracking practices.

Finally, Chapter Eight concludes the thesis by summarising findings relating to the four research questions and the three themes of this thesis: differences in self-tracking practices, feelings, and sharing. Chapter Eight emphasises the importance of self-tracking studies in China as an extension of this research field and as a sociological contribution to self-tracking literature. Following this, the final chapter acknowledges some limitations of the study and suggests research directions for future studies.

Chapter 2 Literature Review

2.1 Introduction

This thesis investigates everyday data practices to understand how people make sense of their personal self-tracking data in everyday life. In an empirical study of datafied healthcare technologies, Lomborg and her co-authors (2020) used the concept of data ambivalence to explore the doubtful meanings of data through data, patients' interpretations of data, their uncertain and ambiguous experiences with data, and self-tracking contexts. Lupton (2018) used the term 'data sense' in a study tracking cycling to emphasise the importance of self-tracking contexts in relation to feelings about and understanding data. Exploration of communicative and narrative meanings of data is also important in this scholarship (Sharon and Zandbergen, 2017). Existing studies highlight how individuals' interpretations, personal experiences and self-tracking circumstances can help with understanding what data means to individuals. Following the perspectives of four disciplines (data studies, digital sociology, media and communication, and STS), this research aligns with these aspects of everyday personal self-tracking in attempting to investigate how Chinese people interpret their data to meet their own daily life conditions. The fundamental research question in this study asks: what do digital self-tracking practices and data mean to Chinese trackers?

This literature review is divided into four sections to summarise the trajectory of research in the field of self-tracking and to pose key theoretical ideas. I first give a brief account of the development of scholarship on self-tracking, considering the literature on Quantified Self (QS) tracking, the diversity of self-tracking, and everyday digital self-tracking to understand how digital self-tracking studies shift from a specific research focus on QS to recent everyday digital self-tracking. This section discusses the limitations of QS tracking studies and the importance of studying self-tracking in everyday life beyond QS. Also, this section highlights the research gaps in studying the diversity of self-tracking in the Western world. In this field, researchers generally study one type of self-tracking, such as cycling or calorie counting, but few researchers have studied a broader spectrum of self-tracking practices or suggested different types of self-tracking practices and technologies. The chapter then turns to address the relationship between feelings and data, exploring ways of feeling about data and the body. I proceed to focus on discussions about sharing everyday self-tracking data. The final section briefly discusses existing research about digital self-tracking in China, which shows a research gap in this field.

2.2 History of Self-Tracking Research

2.2.1 QS self-tracking

Much early research into self-tracking focuses on the QS movement (Nafus and Sherman, 2014; Pink and Fors, 2017b; Sharon and Zandbergen, 2017). Scholars often conceptualise QS as a community of committed self-trackers who share their tracking experiences in local groups and at conferences to learn more about themselves through unusual and complex self-tracking. The QS movement was founded by Wolf and Kelly in San Francisco in 2007, and then spread around the world. In 2019, it had 224 groups and 93,980 members in 116 cities across 36 countries (Meetup, 2019).

QS self-tracking sometimes involves the use of self-tracking technologies in a critical or creative way, such as through the modification of existing technologies or the creation of new ones (Pink and Fors, 2017b). Research has shown that QS claims to grant individual users broader and deeper self-knowledge to achieve transparency and self-optimisation (Schüll, 2016; Swan, 2012; Wolf, 2010). These two principles come together in the QS slogan, "self-knowledge through numbers". The idea of transparency means that increasing volumes of data through new self-tracking technologies can make the world more transparent. Swan (2012) explains that QSers can understand their own bodies and obtain early warnings for health issues. Self-optimisation is the goal of tracking diverse aspects of the self (Lupton, 2016b), body, and life (Choe et al., 2014). For instance, through self-tracking, QSers aim to improve their health, obtain new life experiences and maximise their work performance.

Swan (2013) gives a broad definition of a QSer as any person who has participated in any type of self-tracking practice, whether biological, physical, behavioural or environmental. Other researchers understand QSers as those who participate in the QS community either online or offline and develop their social relationships online and offline with other members who use the same self-tracking technologies (Lupton, 2016b; Whooley et al., 2014). They suggest that QSers tend to share their offline and online self-tracking experiences, use existing technologies in innovative ways, invent new self-tracking technologies, and gather data through technology in order to quantify and analyse all aspects of human activities (Choe et al., 2014; Pink and Fors, 2017b).

For instance, Whooley and colleagues (2014) suggest that the uses of self-tracking by QSers are creative. Some users experiment with their data and bodies, create new tools and technologies and write software to quantify their life. Choe and colleagues (2014) also suggest that QSers use devices and apps in a critical way. For example, some of their participants performed their own studies as lay scientists to address chronic issues. They wanted to construct their identity as a "new and better self" (the "quantified self"), believing that gathering quantitative data about themselves is a good means of making themselves better (Choe et al., 2014). Lupton and Smith (2018) note that many QS enthusiasts are interested in using advanced digital techniques and custom technologies to track and analyse themselves. They enjoy presenting their experiences in public, such as at QS events, on the official QS website or by positioning themselves as active self-trackers in the QS community.

This high level of visibility is probably why QS self-tracking has attracted much research attention. Thus, QSers' self-tracking practices have been the subjects of numerous studies (Lupton and Smith, 2018).

Besides the QS movement's celebration and researchers' enthusiasm about the empowering potential of quantified data to users, many critical scholars of self-tracking and QS question narratives around self-tracking technologies and data (Lupton, 2012, 2013, 2015; Ruckenstein, 2014; Sharon, 2017; Sharon and Zandbergen, 2017). QS ethnographies highlight the complex ways in which self-trackers interpret the meaning or value of their self-tracking data, challenging both the celebratory and critical narratives relating to QS. Nafus and Sherman (2014) find that QSers are concerned with their own bodily cues, rather than completely believing the self-tracking data that they produce through their devices or apps. Sharon and Zandbergen (2017) argue that critical data scholars portray QSers as data fetishists who reduce complex phenomena to quantified data and displace other means of expressing meanings of data. In contrast, in their study of QS, Sharon and Zandbergen claim that this is not a fair representation. They observe that QSers have a large number of different meanings or uses for the data and have different motivations for self-tracking. Some researchers find that QSers often question the data they receive from devices, and judge which data benefits them and which they should ignore. In this sense, QSers understand their own data in different ways and disregard some data in what Nafus and Sherman see as a form of "soft resistance" (Nafus and Sherman, 2014, p.1789).

Ethnographic studies of QSers' individual experiences and meanings of self-tracking highlight the creativity and autonomy of QSers as users. These illustrate that some QSers are not 'data fetishists' who strongly rely on the numeric outputs of their devices. Rather, they supplement new meanings to their self-tracking data when they link their data with other aspects of daily living such as tacit knowledge, their tracking environment, personal experiences or even everyday routines (Nafus and Sherman, 2014; Sharon and Zandbergen, 2017; Weiner et al., 2017). They also show the complex ways in which QSers understand their data or assess the value of their data. These discussions argue that individual self-trackers such as QSers have empowerment to critically use and think about the technologies and data. Thus, when it comes to the exploration of diversity in self-tracking practices and the meanings of self-tracking, knowledge of the individualisation and empowerment of Chinese self-trackers is necessary.

The QS community has been a popular space in which social scientists collect data and conduct their empirical research into self-tracking. These QS studies have proven that to understand self-tracking, it is necessary to consider the data themselves as well as personal experiences and other aspects of daily living (Weiner et al., 2017). However, QS self-tracking does not represent the experiences and insights of non-QS self-trackers in the wider population. As a result of this absence, a number of researchers – myself included – are inspired to investigate the realities of self-tracking in everyday life, which will be discussed in the next two sections.

2.2.2 The diversity of self-tracking

Overall, research on self-tracking has mostly focused on one type of activity, while research comparing different forms of tracking is rare. Little research has compared the diverse forms of self-tracking that are becoming an integral part of everyday life. That most self-tracking studies focus on specific case studies makes it hard to compare different types of self-tracking. My research will address this absence, by exploring the diversity of everyday digital self-tracking practices of Chinese self-trackers. This section will review the different types of self-tracking that have been the focus of previous self-tracking studies.

Many studies focus on tracking steps, physical activities (running and cycling), weight, calories and food consumption, heart rate, sleep, and fertility and pregnancies (Costa Figueiredo et al., 2018; Crawford et al., 2015; Didžiokaitė et al., 2018a; Elmholdt et al., 2021; Lomborg and Frandsen, 2016; Pantzar et al., 2017). Researchers study apps with pedometers (Nike Fuel, Map My Run), and some of the most popular apps for tracking steps (e.g. Crawford et al., 2015; Kent, 2018; Sharon, 2017). They consider the ways in which some users track hikes or long-distance walking, while others automatically track their real-time steps walked during the day (Rooksby et al., 2014).

Some projects study dedicated physical devices that are used to track various fitness activities such as running, cycling and swimming. The two most common are for running and cycling, as studied by several researchers (including Lomborg and Frandsen, 2016; Lupton et al., 2018). For example, Pink and Fors (2017) focus on how people use these technologies, demonstrating different types of self-tracking technologies, such as the Runkeeper app for running and Fitbit wearable wristband for general exercises in everyday life. Pink and colleagues (2017) research self-tracking cycling in everyday life: many participants tracked cycling activities using the Garmin watch and then transferred their data automatically to the Garmin app or web-based Strava account. This mixed self-tracking meant that researchers centred their research on everyday cycling routines and self-tracking habits, rather than on the ways in which self-trackers used different devices and apps for monitoring cycling activity.

Weight tracking is also a commonly studied daily activity. Researchers have found that users buy smart scales such as Weight Watchers and MyFitnessPal or use video games such as Nintendo Wii Fit to manage their weight (Crawford et al., 2015; Lupton, 2017a, e; Schüll, 2016; Sharon, 2017). Some of these self-tracking technologies can be connected to apps to automatically store the data. Otherwise, users can manually enter their weight information into the apps (Nafus and Sherman, 2014; Rooksby et al., 2014).

Another daily self-tracking routine that has been a popular research subject is food consumption. Researchers have studied users' calorie intake and nutrition, which are tracked for dieting purposes. For example, participants in a study by Didžiokaitė and colleagues (Didžiokaitė et al., 2018a, b) were interested in weight loss as they tracked calories with the MyFitnessPal app. The study by Didžiokaitė and colleagues demonstrates that each self-tracker responded differently to the methods of calorie counting, thus there was "no unified way" (p.152) to track calories with the app. In a study on the meaning of self-tracking for

QSers (Sharon and Zandbergen, 2017), participants tracked food consumption and physical activity.

Sleep pattern tracking has been studied by social scientists, to investigate how users track sleep duration and phases using apps (like Garmin and Fitbit) to improve sleep quality (Fage-Butler, 2018; Lupton and Maslen, 2019). Some researchers have studied tracking of the heart rate (Pantzar and Ruckenstein, 2015), mood (including stress levels) (Sarzotti, 2018), menstrual cycles and sexual activities (Lupton, 2015). For example, Lupton (2015) notes that women use fertility apps to track ovulation and menstruation cycles to gain knowledge about their bodies. They find digital self-tracking of these aspects of their bodies was more accurate than reflections on personal experiences and observations of the body's symptoms, patterns and sensations in a traditional way.

Although these studies focus on one type of self-tracking, taken together, they provide a picture of people tracking various activities, often tracking the same activity in different ways. Differences in self-tracking practices exist in everyday life in terms of what, why and how to track. A small number of recent everyday self-tracking studies point towards the need to compare differences in self-tracking practices. Some recent studies find that people track more than one activity and use different devices and apps in different ways. Many self-tracking technologies present not only one measurement, but several. People may only use one device or app, while some may use several at once (Pink and Fors, 2017; Rooksby et al., 2014). Self-trackers may be interested in different activities (Lomborg and Frandsen, 2016; Lupton and Smith, 2018), or use several technologies to conduct more than one self-tracking activity or track one type of activity by more than one tracker (Rettberg, 2014) or technology to track several activities (Fiore-Gartland and Neff, 2015; Lupton and Smith, 2018). Although the comparison of different types of self-tracking practices has not been the central research focus in most previous self-tracking studies, their findings and participants demonstrate that such differences do exist.

Some researchers suggest that users frequently use more than one self-tracking device, and many people record and access their self-tracking data from the same device in more than one way. Lupton and Smith (2018) find that users commonly track several things simultaneously using different methods "with contrasting intensities of effort" (p.3). In their study, most participants tracked bodily situations or daily activities such as diet, weight, sleep and physical activities at the same time, while some also monitored aspects of their lives such as work productivity, finances, and social relationships. Walker Rettberg shares her experiences in using a Fitbit and later a Misfit Shine to track her sleep (Rettberg, 2014) and the Trixie Tracker website to track her baby's sleep patterns (Rettberg, 2009).

In a study of personal tracking in everyday life, Rooksby and colleagues (2014) find that self-trackers use self-tracking technologies in several different ways for their own purposes, and most often only use limited functions of the devices. Some participants attempt to track as many aspects of their lives and bodies as possible, while others disregard other functions of apps and devices and only focus on whatever they need to track. For example, one participant

might turn off (or ignore) the calorie and steps tracking features of the Nike Fuel and Rosemary Conley apps, as they are not necessary for their personal goals.

In everyday life, people use traditional tools and digital technologies differently for self-tracking. Some studies suggest that users combine traditional self-tracking with digital self-tracking to monitor their lives and health situations. By looking at the relationship between the everyday use of self-tracking technologies, the environment, and the mind and body of users, Pink and Fors (2017) demonstrate that participants (who are not professional athletes) combine self-tracking physical activity apps and coaching to track their running data while training for races. Further evidence of mixed self-tracking is provided in a study by Rooksby and colleagues (2014) involving interviews with self-tracking users who combine different self-tracking technologies and activities. Rooksby and colleagues (2014) find that participants combined written diary entries with self-tracking apps to record as many aspects of their lives as possible or synced self-tracking data with computers.

In short, some people might choose one self-tracking technology and stick with it, while others might track various aspects of their bodies or lives by using different apps and devices at the same time. Rooksby and colleagues (2014) conclude that people track themselves in different ways, as they might live their lives differently due to personal living routines and situations. Studying the diversity of everyday self-tracking is necessary because, as recent work has shown, individuals use digital self-tracking technologies differently as part of their daily lives. Only a small number of researchers have studied diversity in apps, devices, things that are tracked and the ways in which they are tracked. Diversity has not been central to in self-tracking research nor has it been studied systematically. This project will address the lack of comparative research into different self-tracking activities by making it central to the question: what do self-tracking practices and self-tracking data mean to ordinary people in China?

2.2.3 Everyday self-tracking

Some self-tracking researchers (such as Didžiokaitė et al., 2018b; Sharon and Zandbergen, 2017) claim that QSers were atypical trackers compared to people outside of the elite QS community. However, some have been motivated to study QSers' self-tracking practices due to the popularity of the QS movement. In the more recent history of self-tracking scholarship, there has been an explosion of ethnographic work about everyday self-tracking beyond these communities (Didžiokaitė et al., 2018b, Pink and Fors, 2017a). Every year, more devices and apps are released to help consumers track aspects of daily life and health, receiving increasing attention, especially as they remain inexpensive (Statista, 2019). As a result, the population of self-trackers is rapidly growing in everyday life. As digital self-tracking becomes commonplace (Lomborg et al., 2018, Walker Rettberg, 2014), so does the prevalence of its data is also becoming common (Kennedy, 2016). This has attracted the attention of social scientists, resulting in everyday self-tracking studies.

Ruckenstein and Pantzar (2017) suggest that the focus on QS ignores and downplays other self-trackers. Didžiokaitė and colleagues (2018a, b) also claim that it has diverted attention away from an understanding of the everyday self-tracking experiences of ordinary users. Their empirical research into everyday self-tracking highlights that the experiences and understanding of ordinary people in self-tracking contrasts with previous findings relating to QS self-tracking. Other researchers (such as Kennedy, 2018) argue that the self-tracking of QSers cannot represent all uses and users of self-tracking technologies. Lupton and Smith (2018) similarly claim that QS studies have not uncovered the experiences of ordinary self-trackers, who do not tend to self-identify with the QS community.

Empirical studies have also shown that ordinary self-trackers have similar features but some differences to QSers. Pink and Fors (2017b) conducted ethnographic research in Australia and Sweden from 2014 to 2016. They show that ordinary self-trackers do not necessarily talk about their personal data on public forums or regularly communicate with others in any community. Rather, they use the devices and apps only for personal daily routines. Even though they sometimes share their data, this is only with friends in their networks rather than with members of a self-tracking community. Sharon and Zandbergen (2017) point out that their QS study may represent a broader population of self-trackers in the future. In contrast, more recent research suggests differences between QSers and people outside of QS.

Didžiokaitė and colleagues (2018b) distinguish between QSers and everyday users in the context of calorie tracking on MyFitnessPal in terms of three aspects: goals, use, and effects. According to Didžiokaitė and colleagues (2018b), ordinary users do not expect to optimise or reveal their bodily situation, instead they have a personal limited goal, such as weight loss. Participants are uninterested in exploring the advanced functionality of the app or in observing or critiquing (historical) data. Rather, they rely mostly on its basic features, looking at the data they have produced during the day and trusting the data provided by the app. They trust the device and data as if it are expert knowledge and they aim to change their daily behaviour and awareness of their eating habits. Although they obtain new knowledge about calories contained in food to restructure their meals, they have no desire to completely change their lifestyle; once they have lost weight, they may stop using the app and return to their previous eating habits.

As Crawford and colleagues (2015) note, many self-trackers never attend QS-related conferences, meet-ups or online groups; many are probably unaware of the existence of the QS community. These types of self-trackers were referred to by Didžiokaitė and colleagues (2018b) as “ordinary men and women” (p.1470) or “everyday self-trackers” (p.1472). Their self-tracking activities may be seen as mundane self-tracking practices (Didžiokaitė et al., 2018a, b; Pink et al., 2017). Lupton and colleagues (2018) identify data related to everyday self-tracking practices as “mundane data”, and these types of practice as “mundane data practices”.

Lupton, one of the most influential researchers working on self-tracking studies, shifted her interest from QS to the more mundane aspects of self-tracking. She has cooperated with other researchers to write a series of articles (Lupton et al., 2018; Lupton and Smith, 2018; Pink et

al., 2017) to investigate how digital self-tracking data becomes meaningful in everyday life; how self-trackers produce, experience and engage with self-tracking data; and how they understand their data.

A study of self-tracking cycling commuters (Pink et al., 2017) shows the ways in which their everyday lives are influenced by self-tracking data and how they influence the production, use and dissemination of self-tracking data. This project (Lupton et al., 2018) suggests that self-trackers tend to understand the meaning of their self-tracking data and the implications for their daily lives. These works illustrate how self-trackers' daily experiences, knowledge of their own bodies, and the insights offered by their self-tracking data can all contribute to understanding their data.

Growing studies of everyday self-tracking, some of which I have reviewed above, suggest that there are many differences as well as continuities between the experiences of QS members and ordinary self-trackers. These new insights can help us better understand what ordinary self-trackers actually do. The literature in this field is relevant to my study and informs this study's central aim of asking what everyday digital self-tracking data means to ordinary Chinese self-trackers. The empirical chapters focus on three topics: a) differences (discussed above); b) feelings and c) sharing, both of which are important themes in self-tracking literature which are discussed below.

2.3 Feelings About Self-Tracking

Sociology literature has highlighted how feelings play an important role in seeing and knowing everyday life (Adler et al., 1987a; Hochschild, 2002; Jacobsen, 2019; Scott, 2009). Exploring feelings is beneficial for understanding how people make sense of their self-tracking technologies and data. Researchers have begun to focus on emotions in data studies (Kennedy, 2018; Kennedy and Hill, 2018) and self-tracking studies (Lomborg and Frandsen, 2016; Lupton et al., 2018; Pantzar and Ruckenstein, 2015, 2017) to understand the role of data and data visualisations in everyday life. Also, how people feel about self-tracking data depends on individual interpretations and their personal mundane lives (Pantzar and Ruckenstein, 2017). In other words, studying feelings is a useful way to understand whether self-tracking data are meaningful or valuable for ordinary users. To understand the different meanings of self-tracking to people, this section focuses on self-trackers' feelings.

In this section, I discuss definitions of feelings in the self-tracking scholarship, describe the concept of feelings for this study, and identify three themes relating to feelings of self-trackers about accurate and inaccurate data, and data histories. These feelings have emerged in empirical research into self-tracking. This section thus presents how self-trackers feel about self-tracking in the context of the West and contributes to exploring how Chinese people feel about and interpret tracking.

2.3.1 Definitions of feelings in self-tracking studies

Burkitt (2002) suggests that emotions only make sense when linked to other things, both humans and objects. He provides the example that people feel angry when other people or objects stop their goals. I borrow this example to explain the importance of studying feelings for understanding meanings of digital self-tracking for individuals. Technologies and data can be meaningful when self-trackers feel connections with them. Also, people observe, learn, understand, and think about their bodily conditions through feelings.

Based on my personal spoken experiences and Chinese language literature, I identify the meaning of feelings in self-tracking in this chapter as those felt in the mind and body: emotions, bodily sensations, and physical senses. Feelings can mean opinions and attitudes, but not in this study. The word 'feel' (感觉) and 'think' (认为) in natural spoken Chinese conversation can be analogous but different and both often mean judgement, opinions, and attitudes. Chinese language researchers (Endo, 2010; Yang, 2021) suggest that 'feel' can be used to describe bodily and emotional feelings but also opinions. These meanings of feelings in different discourses also came up in my study. When my participants said, "I feel" (我感觉), it could relate to opinions, judgements, or certain facts in the same way as saying "I think" (我认为). For example, when Xinyue (40, male, IT engineer, initial interview) said, "I feel it is good enough to collect the sport heart rate data, because I am not monitoring it for clinic treatment after all". This is how he shows his attitude. Also, the word 'feel' can mean opinions but with some hesitation and uncertainty, for example when people express their opinions without strong evidence. Yang (2021) explains this type of feelings as light think, subjective speculation or uncertain inference. For example, Zoe (27, female, Internet employee, history of depression, initial interview) said "I feel most people may use the Meetyou app to track their menstruation cycles", which is a supposition and a generalised assumption about the app's users. Thus, this type of feeling is considered to be an attitude, which is not discussed in this study.

The terms 'feeling', 'emotion' and 'affective' are used interchangeably in previous studies to describe people's emotions. For example, Kennedy and her co-researchers (e.g., Berg, 2017; Kennedy, 2018; Kennedy and Engebretsen, 2020; Kennedy and Hill, 2018) describe a range of feelings and emotions among their participants in relation to numbers and visual representations, such as anger, sadness, worry, and excitement. Similarly, in many self-tracking studies three terms commonly represent people's emotional engagement with multiple aspects of self-tracking, which contribute to forming meanings of self-tracking for individuals (Lomborg and Frandsen, 2016; Pantzar and Ruckenstein, 2015; Rooksby et al., 2014; Ruckenstein, 2014). In an example of a study tracking stress and heart rate, Pantzar and Ruckenstein (2015) describe the affective relationship between data and users in which people involve their emotions in bodies, activities, data, and devices. In another example of emotions defined as affective responses, Lupton (2017c; 2018) suggests that people emotionally rely on their digital health devices. Findings from her project reveal positive feelings such as confidence and achievement, and strong negative feelings such as disappointment when the devices fail to meet their expectations or record their data.

Similarly, Lomborg and Frandsen (2016) consider feelings to be affective responses such as gratification, pleasure, irritation, and annoyance. They argue that positive feelings about self-tracking represent people's satisfaction with their achievements and needs, which are associated with data visualisations provided by devices and apps, and what self-tracking means to people is informed by their cognitive and affective capacities. This shows the importance of emotions for people to interpret their bodies and meanings through the technologies and data they use daily. In this thesis, I use the concept of feeling to refer to emotion, which helps to understand the intertwined relations between technologies, data, body, and emotions.

Part of the exploration of such interactions in self-tracking practices is the embodied dimensions. In some ethnographic studies on self-tracking, feelings are seen as embodied sensations and how people understand their bodies' functions and the self when they engage with the technologies and data. The concepts of bodily sensation, embodied sensation and bodily feeling in self-tracking studies are often interchangeably used to refer to physiological responses (such as feeling sick, in pain, tired and healthy) to data and other aspects in digital self-tracking practices. For instance, in a study of how people collect and use their data in digital cycling self-tracking practices, Lupton and her co-researchers (2018) use the terms bodily sensation and embodied sensation to discuss embodied human senses such as fatigue and sensory responses. Capturing bodily sensations through self-tracking enables people to learn and think about things they track, but it depends on individuals' capacities to make sense of the relation between bodily feelings and their data (Kristensen et al., 2021; Weiner et al., 2020). Bodily feelings are sometimes unseparated from emotions, which influence ways of self-tracking and opinions about the self and data. For example, Kristensen and colleagues (2021; 2018) suggest that tracking bodily infirmities and relevant data can generate proud and happy emotions and encourage participation in further achievements and challenges. Thus, the focus is on self-trackers' bodily sensations in this study to explore embodied experiences and knowledge about bodily states, health conditions and data learned from such feelings. Particularly, the Chinese medical culture relates to how Chinese people feel about their bodies, which can differ from how Westerners feel. It is important to consider bodily sensations and emotions together to investigate people's understandings of their data and bodies.

Another type of feelings relates to physical senses about digital self-tracking devices and data, which is commonly discussed in the sensory nature of self-tracking. For example, Lupton's (2017b) work identifies feeling data in two aspects: sensations of touching three-dimensional (3D) objectives (the senses of hearing, taste, and smell) and sensory responses (feeling weather, roads, or digital sensors). She categories this type of feelings as part of bodily sensations, so-called bodily sensory responses. Scholars suggest that this type of feeling is affected by affective atmospheres (Anderson, 2009; Fors et al., 2013; Kristensen and Ruckenstein, 2018; Lupton, 2017c) that are formed by different sensory properties. Lupton and colleagues (Lupton, 2017c; Lupton and Maslen, 2018) argue that self-tracking technologies facilitate people's embodied sensory capacities and perceptions which might not be noticed by them, and the sensory responses guide people to understand what their data tell

them. Also, people's bodies are situated in an affective environment in which they conduct cultural and social practices (Fors et al., 2013). In other words, this sense of bodily sensory response has an interrelationship with objects, places and spaces. So far, discussion around affective, sensory, and embodied responses shows a complexity of feelings, and the overlaps and interrelations of different types of feelings.

Conceptualisation of these feelings is not the focus in my study. Rather, by explaining these terms, I develop my own understanding of them to help me explain the role of participants' feelings in making sense of self-tracking. Thus, in my study, the term of sensory responses (e.g. touch, motion, and imagination) (Fors et al., 2013) is used to serve to represent people's feelings about the seasonal aspect of self-tracking and digital sensors that are built in the technologies, and bodily sensations only focuses on encounter with physiological feelings.

To summarise, the concept of feeling in this study has three types of meanings: emotion, bodily sensation, and sensory response. Emotion means affective feelings; bodily sensation relates to physiological responses; and sensory response refers to feelings about self-tracking environments and sensors of devices and apps. Bringing the concept of feelings to this research helps with understanding how self-trackers learn, think, and feel about and through their technologies, data, and bodies within the Chinese cultural context, and their interwoven relations that are integral to meaning-making of self-tracking.

2.3.2 Overview of feelings identified in self-tracking research

As discussed in the previous section, feelings have been given multiple meanings by different self-tracking scholars. Although this is not the focus in many self-tracking studies in the West, their analysis and findings demonstrate that self-trackers do express their feelings and bring them together with their experiences and attitudes when they talk about their engagement with self-tracking practices and data. Although there have not been any theoretically and empirically sociological studies of self-tracking in China, Chinese self-trackers represent some emotions about technologies in other disciplines of self-tracking studies in China. Thus, this section summarises the types of feelings that researchers have identified in self-tracking research. It highlights why ordinary individuals' feelings matter when researching meanings of self-tracking.

Feelings about self-tracking data that are perceived as neutral

Several studies have shown that some self-trackers see their data as neutral. Existing studies suggest that self-trackers who think of their personal data as neutral and accurate feel trust towards the data, although the data may represent different aspects of objectivity (Lupton, 2015; Lupton et al., 2018; Pantzar and Ruckenstein, 2017; Sharon and Zandbergen, 2017). Users who feel motivated and joyful think that the data can tell them something objective about their body, representing the complexity of the real life behind the data, and some

become mindful through it. Sharon and Zandbergen (2017) interviewed QSers in a break-out session of a QS international conference, and some participants believe that their self-tracking data represent truth. For instance, one participant explains the feelings about the data from self-tracking physical activity that objective data are felt to be more trustworthy than personal feelings and subjective knowledge (Sharon and Zandbergen, 2017). Some cyclists in research by Lupton et al. (2018) feel reassured that their data on the smart Garmin watch show accurate riding speeds and time taken to change gears. Similarly, in a study tracking stress, Pantzar and Ruckenstein (2017) suggest that a few participant felt surprised and relieved as their data show stress beyond their negative expectations, which made them start to rethink their stressed conditions. As discussed so far, the literature suggests that people's feelings about the objectivity of data are associated with trust in what data tell them. Feelings draw people's attention to self-reflection and self-knowledge in relation to the self and things in which they participate and track.

When self-trackers bring their bodies into their interpretations of data, bodily sensations trigger and stir their emotions and are involve in making sense of the data. Weiner and others (2020) point out that data are viewed to bring a feeling of peace, for example, knowing blood pressure data makes people less anxious about their bodies when they experience bodily feelings such as headaches. In a study of how self-trackers feel about and understand their data in relation to their embodied experience, Pink and Fors (2017) explain the relationship between the data, physical experience, environment and the use of self-tracking technologies. They demonstrate that some users (such as Jason, a serious but non-professional athlete) use several devices and apps to monitor their heart rate while running uphill. For them, heart rate is a simple, honest signal which tells them how hard they can push themselves to run and how their bodies feel. They suggest that some participants trust their data, because for them, the data are not simply a representation of their bodies, but also an overall outcome involving complex elements such as body, mind, technology and environment. In a study of contraceptive tracking apps, Algera (2022) states that self-tracking should no longer be treated as a tool to simply collect data about people's bodies, rather than to develop their abilities to "learn to feel, sense or know (with)" (p.245) their bodies. She illustrates a range of bodily sensations (headaches, feeling energetic or unwell, and neck pains) to explain how people record and interpret their bodily sensations and justify the objectivity of their data.

Thus, recording and seeing data trigger feelings and thinking about bodies and other relevant elements involved in self-tracking practices. There are interrelationships between bodily sensations, emotions and data. This thesis develops this discussion further to explore the interrelationship between emotional resonance of different self-tracking practices associated with data and bodies.

Feelings about self-tracking data that are perceived as inaccurate

Self-tracking data seem to represent human subjects as objective data through numbers, visualisations and texts, but many scholars (Lupton, 2013, 2014; Reigeluth, 2014; Sharon and Zandbergen, 2017) argue that the data are far from neutral. The scholarship indicates that

many self-trackers regard their self-tracking data as inaccurate, although self-trackers as discussed above believe that their data are accurate and objective. Due to the inaccuracy and incompleteness of data, people can feel disappointed about their data (Nafus, 2014; Pink et al., 2018; Yli-Kauhaluoma and Pantzar, 2018). In contrast, others still enjoy reviewing their data and feel encouraged to continue producing, storing and learning from self-tracking data, although they realise that sometimes their data are not always accurate (Algera, 2022; Lupton et al., 2018; Sharon and Zandbergen, 2017).

Pink and colleagues (2018) claim that personal self-tracking data are incomplete, inaccurate and dispersed in everyday mundane activity. Users feel that their data appear to have no value or accuracy, as the data are confusing and mysterious (Nafus, 2014). People can also feel annoyed and challenged by the data, as it sometimes paints a different picture of their situation than the one they had in mind. In the study of self-tracking cycling data by Lupton and colleagues (2018), a participant named Damon decided to rely on his sensory knowledge to respond to the safe conditions of the ride rather than the digital cycling data. He also reported that "it's good having the watch as well to validate that feeling versus reality" (Lupton et al., 2018, p.657), but reviewing his digital data sometimes made him feel confused about what the actual facts were.

Reality and users' feelings are likely different from what the data tells them. Lupton and colleagues (2018) note that users' bodies could usually tell them more about a ride than their digital data. For instance, one participant felt that his data failed to incorporate some elements of cycling conditions such as weather or location and was blind to the feelings of his body. Another participant had a similar experience in that he actually felt that the speed of cycling was sometimes quicker or slower than the information shown by the data. Yli-Kauhaluoma and Pantzar (2018) suggest that people feel confused, perplexed, disappointed, annoyed, and doubtful about their data, which leads to seek other solutions to gain benefits from self-tracking which do not always succeed. Thus, self-trackers' experiences cast doubt on the idea that self-tracking data may displace other forms of meaningful expression (Lupton, 2015; Sharon and Zandbergen, 2017; Yli-Kauhaluoma and Pantzar, 2018).

Several findings in empirical studies have suggested that the data generated are not the most important thing for many self-trackers (Didžiokaitė et al., 2018a, b; Lupton et al., 2018). For many participants, inaccurate data are not necessarily an issue, as they know that the data can never be perfect and complete (Pink and Fors, 2017). Previous studies show that people sometimes have positive feelings despite inaccurate data. Users in a study by Rooksby and colleagues (2014) about the uses of tracking data realised and accepted the inaccuracy of their data, but they thought that the data could motivate them to continue self-tracking. For example, one participant using Nike Fuel felt motivated by the data on this app and explained that "the number isn't very accurate, but it makes sense" (Rooksby et al., 2014, p.1169); another participant realised that "accuracy is not that good, but it wouldn't bother me" (Rooksby et al., 2014, p.1169). Despite knowing about the potential for inaccuracy, people try to find ways to work around issues to feel satisfied with continuing their self-tracking.

Through their empirical studies, several researchers (Lupton et al., 2018; Pantzar and Ruckenstein, 2017; Pink et al., 2018) agree that accuracy might not be one of the users' most important concerns or values. Fiore-Gartland and Neff (2015) explain why users can accept inaccurate data: they suggest that self-tracking data has actionability that helps users develop new awareness and change their habits; thus, for many self-trackers, inaccurate data are still acceptable and useful.

Feelings about data records

Moving beyond feelings about data accuracy, some scholars have drawn attention to data records. The literature has discussed feelings associated with changes and achievements of self-tracking when it comes to viewing current data and reviewing previous data records. Feelings of joy and satisfaction are derived from good self-tracking progress or successful achievements. For instance, Didžiokaitė and colleagues (2018b) provide an in-depth analysis of trust in data showing that some users feel motivated when they look at changes on weight loss graphs which makes them enthusiastic about nutrition and sports when using the MyFitnessPal app. The data can be used to predict their weight in a few weeks' time, and this causes them to "feel good" (Didžiokaitė et al., 2018b, p.1481) as they can look forward to the future and not worry about their current weight, which is only temporary. In an investigation into self-tracking heart rates by Ruckenstein (2014), many participants felt persuaded and motivated by reviewing past progress in their records to make daily efforts to become healthier. People also felt disappointed and annoyed with data when they sometimes failed to meet their expectations (Fotopoulou and O'Riordan, 2017). Reviewing the literature on feelings about data records demonstrates the importance of studying how feelings matter to forms of self-tracking and what Chinese people do when they have feelings about their records.

However, the failure of achievements evokes disappointment, annoyance, worry, sadness, and frustration. People are sometimes unsatisfied with their results and failure to achieve goals, which may even cause them to stop using tracking devices and apps (Didžiokaitė et al., 2018a; Lomborg and Frandsen, 2016; Rooksby et al., 2014). Rooksby and colleagues (2014) show that when some participants check their data about steps walked and calories burned, they are aggrieved as their efforts do not allow them to achieve their goals. One participant said: "It's only that many calories for all we've been doing… we lost interest…" (Rooksby et al., 2014, p.1168).

Some scholars note that acquiring new knowledge from the recorded data helps people to enjoy healthier lives. As part of this learning process, people feel that their data make them become more mindful – mindful feelings such as a 'sixth sense' are developed by day-to-day self-tracking experiences and the information learnt from data gathered over long periods. Many researchers (Didžiokaitė et al., 2018a; Fiore-Gartland and Neff, 2015; Lupton, 2019; Sharon and Zandbergen, 2017) have highlighted that data can lead to an increased mindfulness and awareness in users and can thus change their behaviours. As evidence for the argument of self-tracking as a practice of mindfulness, in research by Sharon and

Zandbergen (2017), one participant who tracked his food consumption for several years believed that his data help him develop a 'sixth sense' around the relationship between food and his mind, and the data made him mindful of how many calories food contains, which he could tell just by looking at it. Similarly, another participant believed that numerical data are more like an "unsophisticated, intermediate stage towards more augmented senses" (Sharon and Zandbergen, 2017, p.1700). As Sharon and Zandbergen (2017) conclude, for these self-trackers the improvement of awareness is more important than the actual data generated by self-tracking. In another example, many self-trackers in Didžiokaitė and colleagues's (2018b) research on the effects of self-tracking reported that the data make them "really, really mindful of what you are eating during the day" (p.1482) and changed their perceptions and awareness about how to choose food, how many calories particular food has and more. Thus, data play a role in developing mindful feelings about the self and things, and subjective feelings are powerful for understanding individualised minds. This discussion is helpful for analysing how feelings, bodies, minds and data work in the empirical feeling chapter.

This summary of the feelings of self-trackers towards their data and bodies provides a picture of how participants in previous empirical self-tracking studies described their feelings. These personal descriptions have suggested that feelings play an important role in understanding self-tracking data and bodies. By building on these themes, which derive from studies of self-tracking in the West, the present study investigates the feelings of Chinese self-trackers and the extent to which these themes apply to different kinds of self-tracking in the Chinese context. As such, the literature about feelings emerging in self-tracking addresses two related research question of this thesis: RQ2: *how do Chinese self-trackers feel about their different self-tracking practices and data?* and RQ4: *do themes (identified in the literature review) apply in the Chinese context, or do new themes emerge? How do the findings relate to current scholarship?*

2.4 Sharing and Communicating About Self-Tracking

Besides having feelings about data, sharing self-tracking data also involves a process of making sense of the data. Self-tracking has been conceptualised by scholars in communication studies and ethnographical studies as a communicative practice. Lomborg and her co-researchers (2016, 2018) argue that the fundamental aspect of self-tracking is that self-trackers communicate with themselves, the devices and apps, and other people. This section looks at the literature on sharing in self-tracking studies to understand the communicative meaning of self-tracking in three aspects: self-documentation on social media, sharing self-tracking data as self-representation, and sharing data as social interactions as a method of communication with the self and audiences. These three styles of sharing are sometimes difficult to separate, as they can exist within both shared social media content and offline communication. Self-documentation and self-representations are about socialisation

and communication (Highfield and Leaver, 2016, Rettberg, 2017), and social interactions are the key to constructing identities as well (Sharon and Zandbergen, 2017).

Literature related to these three aspects of sharing and self-tracking can help to understand not only the importance of individuals' subjective self-tracking experiences and feelings, but also meanings of self-tracking for their everyday lives. Researchers such as Dencik (2019) and Couldry (2004) emphasise the importance of decentring data and giving attention to narratives of people using their data in social life. Existing literature on sharing suggests that people share everything online, from personal lives to political issues and from health information to illness narratives, and that social media platforms are used as a social space for direct and indirect conversations (Brake, 2014; Light, 2014; Serafinelli, 2018; Vicari, 2017; Vicari and Kirby, 2022). Specifically, studies about self-tracking practices show that people not only record self-tracking data, but also share and communicate about them along with their daily lives, experiences, feelings, attitudes, and the self (Algera, 2022; Kent, 2020b; Kristensen and Ruckenstein, 2018; Lomborg and Frandsen, 2016; Weiner et al., 2020).

2.4.1 Self-documentation on social media

People share occurrences on social media in their mundane life (Humphreys, 2018). Sharing on social media has been studied by scholars as public self-documentation of everyday life (Alhabash and Ma, 2017; Balakrishnan and Griffiths, 2017; Brake, 2014; Humphreys, 2018). The self-tracking literature demonstrates that self-tracking devices and apps mediate everyday life (Pink and Fors, 2017a), and self-tracking is considered part of a habitual way of living mundane lives (Kent, 2018) and as self-documentation of the self (Gorichanaz, 2019a; Kristensen et al., 2021). Discussion about self-documenting life on social media helps to justify the rationale for studying how tracking data that are self-documented using technology are shared on Chinese social media platforms, and exploring the meanings of self-tracking that are self-expressed online in this research.

The sense of self-documentation is different when it involves social media. The documenting of everyday life can be traced back to the history of diaries (Cardell, 2018; Kitzmann, 2003). In the history of writing traditional personal diaries, writing about the self was as a useful strategy to improve knowledge of the self (Heehs, 2013). Diaries are normally private, but people have publicly published them in serialised form in newspapers, and diary-like information is also frequently shared publicly online (Rettberg, 2014, 2018), particularly on social media platforms. Using an example of sharing experiences of living with cancer, Rettberg (2014) comments that a person used Twitter as a public space to write a diary, even though many of her followers never communicated with her. Rettberg (2014, 2018) argues that all the online documented information adds up and can be seen as diaries. In this sense, self-documentation is a form of self-expression and diary-writing about the self.

The meaning of self-documentation implies interrelation with technologies. In their work on self-tracking as communication, Lomborg and Frandsen (2016) identify how self-tracking includes accumulation of diaries and data on devices, apps and other activities. Gorichanaz

(2019a) also conceptualises its meaning as a form of a interrelated relations between humans and technologies but brings social media into this relationship. According to Gorichanaz (2019a), self-documents of the self are considered to be not only self-tracking data produced by devices and apps, but also personal information that is created on social media such as profiles, video recordings of everyday lives, and selfies. Self-documentation here means a demonstration of certain aspects of oneself, so-called construction of the self, by sharing such creative information about oneself (Gorichanaz, 2019a). That is, these categorical elements of sharing practices are self-documented materials on social media.

Studies suggest a range of styles of documenting lived experiences and lives, such as the use of a shared hashtag for daily documentation on Twitter (Rettberg, 2018), or the sharing of selfies, photos and self-tracking data on Instagram and Facebook (Kent, 2018). Georgakopoulou (2017) conducts narrative analysis on social media and identifies shared content as "small stories" that people share about their everyday lives through statuses, videos and retweets on YouTube and Facebook.

Documenting life stories on social media is also about self-expression. Documenting daily lives and self-tracking data in public is a form of communication between people. Walker Rettberg (2014) identifies forms of self-expression such as selfies, online dairies and seeing the self through peer communication, and she suggests that self-expression becomes self-representation. Thus, sharing as self-documentation of daily life can illustrate online identities. The concept of self-documentation, as discussed so far, is related to self-representation. It helps to address what self-trackers share in China and what is represented in the sharing, when analysing sharing on social media in this research. More discussion of self-representation will be presented in the next section of this chapter, including studies related to how people create the self by sharing their life, body and selves on social media.

Researchers who study documentation of life on social media suggest that social media allow people to persistently document and remember their everyday life stories (Kofoed and Larsen, 2016; Highfield and Leaver, 2016; Humphreys, 2018). People record their participation in self-tracking activities, daily lives, and bodily situations to remember these experiences in the future (Kent, 2018; Rettberg, 2014). Rettberg (2014) uses the example of Twitter to explain the idea of keeping all text online: every tweet can be stored, and people and their audiences can review all previously published tweets. It is notable that the future of social media platforms such as Twitter and Renren (a former leading Chinese social media network) is uncertain. For instance, Renren eventually died in the Chinese market in 2018 (Jia, 2022), and people's documented content on the platform disappeared along with it. Despite these uncertainties, the current literature reveals a high participation in sharing practices on social media platforms in relation to self-tracking, the self and broad everyday life, and new forms of sharing also occurs, including live streaming on social media (including TikTok) (Bhandari and Bimo, 2022; Kennedy, 2019; Meisner and Ledbetter, 2022; Serafinelli, 2018). The practices of continuous sharing are related to affordances of visibility and the persistence of social media. Both affordances enable the shared information to remain (re)visible to users over time on the platforms (Treem and Leonardi, 2013). They also enable users to document the content as historical experiences (Kennedy, 2019) to jog their

memories in the future – unless the platform is removed from the Internet. It is meaningful to study what self-trackers do with their documented information on social media in everyday life in China, which is missing in the digital self-tracking literature.

Self-documentation on social media also makes it convenient for people to access their historical recordings anytime and anywhere, and it plays an important role in self-improvement. Online self-documentation of thoughts, actions and feelings all benefit self-improvement (Kristensen et al., 2021; Throsby, 2016), future self-reflection and behavioural changes (Humphreys, 2018). For example, Throsby (2016) explains that she stores her swimming experiences on Twitter and looks back to check the information as evidence of her progress. She suggests that ongoing tracking, recording, documentation, and memorialisation of marathon swims can remind people of their consistency or improvement. Rettberg (2018) similarly provides a range of examples of self-improvement to suggest that self-trackers gain achievements by documenting self-tracking data, goal setting, and goal completion on apps and social media platforms. Thus, self-documentation on social media platforms is treated as a self-improvement tool by some users.

Sharing is therefore a way of storytelling and documenting personal lives. As Humphreys (2018) argues, the represented intimacy meanings of documented life are more important than the shared content itself. Rettberg (2014) also argues that self-tracking is not really important – it is just a way of telling stories about a life. There are a range of studies exploring the sharing of self-tracking data. However, little is known about what Chinese people represent on social media in China when they share things in relation to self-tracking. Since self-tracking practices are embedded in everydayness, an exploration of sharing about self-tracking is an important lens for understanding the meanings of self-tracking practices and data for individuals in their ordinary life. The next two sections focus on what self-trackers do in their sharing practices in the Western context.

2.4.2 Sharing self-tracking data as self-representation

The previous section reviewed literature about sharing as self-documentation on social media, and the next section discusses sharing as interactive communication with others. Both sections are linked to this one in relation to sharing self-tracking experiences and data to represent online identities. Self-documentation of everyday life and social interactions both involve self-representations. Some researchers have suggested that self-expression and recognising the self through social communication with people are both important aspects of online identities (Kent, 2018; Lomborg and Frandsen, 2016; Rettberg, 2014). This section reviews literature on self-representation in digital self-tracking practices to demonstrate how self-tracking devices, apps and social media platforms shape ways of representing the self.

The self-tracking scholarship suggests self-representations are constructed by self-tracking (sometimes visualised) data, sharing data with others, and uploading visual content within daily status updates online. Conveying self-tracking data is a process of representing oneself (Fotopoulou, 2018; Gorichanaz, 2019a; Kent, 2020b; Kersten-van Dijk and IJsselsteijn, 2016;

Lomborg and Frandsen, 2016; Rettberg, 2014). Although this section focuses on the topic of sharing self-tracking data, it is necessary to discuss the data as self-performance as many existing studies show that data are the core element of self-representation in sharing practices. Rettberg (2014) argues that self-tracking data represent the self, and self-trackers see, know and even develop self-identity through their data. Sharon and Zandbergen (2017) agree that self-tracking data is an instrument of identity construction that allow people to learn and create stories about themselves. Rettberg (2014) suggests that quantitative self-tracking represents the self and lives, and she identifies self-tracking as "quantitative self-representation", including numbers, spreadsheets, graphs, and maps. Various types of self-tracking data as shared information constitute and represent a person; however, self-tracking data can also perform or mispresent them. For example, Rettberg (2014) explains that people sometimes amend their data to make them look better to their audiences and themselves. These studies have illustrated that oneself can be represented through self-tracking data. The data are often displayed in shared posts on social media.

The act of sharing self-tracking data on social media is another form of self-representation. As recognised in previous studies, self-trackers present themselves to friends, followers, and wider audiences by sharing self-tracking data (Kent, 2018, 2020b; Kristensen et al., 2021; Lomborg and Frandsen, 2016; Ruckenstein, 2014; Weiner et al., 2020). In several papers about representing the healthy self, Kent (2018, 2020b, 2021) argues that sharing data on social media is treated as a core strategy of representing the healthy self, and people's daily lives are illustrated within the shared content. She emphases (2018) that self-surveillance and peer surveillance on social media both affect the construction of 'healthy' self-representation, which influences how self-trackers think about their bodies and health conditions. Besides, Ruckenstein (2014) suggests that online sharing with others who have similar self-tracking experiences can gain new and critical views about the self, which is a process of learning the self through sharing. I argue that this process co-constructs the self. Kersten-van Dijk and Ijsselsteijn (2016) comment on Ruckenstein's work that a combination of self-reflection on personal data and sharing of data with others likely involves concerns of self-representation about whether the information about oneself that the data show meets self-trackers' own expectations about themselves. Discussion of self-representation here suggests online sharing is about representing self-interpretation of data and the self, and preforming sharable recognitions of identities. This inspires me to explore how people represent themselves as part of sharing practices in this research.

Visual forms of self-representation on social media in relation to self-tracking have been studied to explore how people express the self, such as selfies, images, and emojis, which also appear in my social media research data (see Chapter Seven). Highfield and Leaver (2016) argue that everyday visual social media content plays a key role in presenting online identities and is a different way of presenting the self through textual content such as posts and comments. Sharing selfies with textual interpretations has also been identified as a form of self-representation (Enli and Thumim, 2012; Frosh, 2015; Marwick, 2015; Tiidenberg and Gómez Cruz, 2015). The growing literature on emojis shows that people communicate and represent themselves through emoji use (Highfield and Leaver, 2016). Rettberg (2017)

explains that selfies are visual and written self-representations as people often use them with text, and that emojis are a form of visual communication. In my research, visual content is an important element of qualitative content analysis, and together text data, it helps with understanding how people represent themselves on social media in China. To summarise, sharing self-tracking data is a form of identity construction. Self-performance on self-tracking devices, apps and social media share and distribute people's identities (Fotopoulou, 2018).

2.4.3 Sharing self-tracking data as social interaction

In the sharing literature discussed above, sharing relates to documenting lives and daily activities on social media. In the self-tracking literature, sharing practices are seen to produce social interactions and communicative meanings of the data alongside relevant personal experiences. Previous studies have shown that self-trackers share their personal data and ideas with other people, which allow them to control reflections of their data, develop social interactions, and emotionally engage with self-tracking (Ajana, 2018; Lomborg and Frandsen, 2016; Lupton, 2016b; Lyall and Robards, 2018; Rich and Miah, 2017). These audiences can be intimate relations, community members, and broad audiences within self-tracking apps (e.g. Fitbit) or social media platforms such as Instagram and Facebook (Kent, 2020b; Lyall and Robards, 2018; Rettberg, 2018; Weiner et al., 2020). As such, self-tracking has been considered by scholars as a method of interactive communicational practice and a way of communally sharing personal stories (Sharon and Zandbergen, 2017; Swan, 2013). The key element of sharing and communicating practices is self-tracking data that play a role as a relay for these practices. In this study, attention is given to self-trackers' sharing practices to explore how people share as part of self-tracking practices and what the communicative meaning of self-tracking is for self-trackers.

A popular exploration of sharing and communicating practices focuses on QSers who share their self-tracking experiences and interpret and re-contextualise their data by giving presentations as well as communicating with other QS members at conferences and meet-ups. Researchers suggest that self-trackers in the QS community interpret, transform and integrate their data into personal narratives (Sharon and Zandbergen, 2017; Swan, 2013) when they share their data with others. Sharon and Zandbergen (2017) state that self-tracking practices have a communicative and narrative dimension. They suggest that people combine self-tracking data with personal subjective stories and treat them as a meaningful communicative and communal practice. In other words, self-tracking data are added to subjective narratives when people share their stories of self-tracking experiences (Sharon and Zandbergen, 2017).

In everyday self-tracking scholarship, formats of sharing self-tracking data are rarely public, such as group meet-ups, public presentations, and peer discussions within the QS community. As Pink and Fors (2017a) point out, self-tracking data and activities are rarely represented or spoken publicly. Rather, sharing data through people's social networks becomes relatively more personal. Common online spaces for sharing data include social media platforms, online groups, and the social communities within self-tracking technologies (Lomborg and

Frandsen, 2016; Paton et al., 2012). As such, online interactions through sharing make the data socially meaningful for self-trackers, when they express their feelings and share self-tracking experiences linked to quantified data.

Sharing self-tracking data establishes social relationships and produces a sense of belonging and sociality. Sharing as a social practice and a way of developing social relationships (John, 2017) enables self-trackers to make like-minded friends, offering mutual encouragement and sharable support to each other, providing a sense of accomplishment, and benefiting goal accomplishment (Kristensen et al., 2021; Will et al., 2020). In their analysis of communicating with peers, Lomborg and Frandsen (2016) note that some of their participants shared exercise data and received several 'likes' and 'comments' on the Endomondo app. They argue that the social data make people feel that they are supporting or being supported by other users. Lyall and Robards (2018) also note that sharing regarded as peer encouragement is essential for those who need to change lifestyles via self-tracking. In this sense, the social and communicative nature of self-tracking data inspire people to stay on track to achieve goals and motivate others in their existing social networks to complete similar activities.

This interactive aspect of self-tracking reveals playful, supportive, and competitive aspects of data. Researchers (Goh et al., 2009; Kersten-van Dijk and IJsselsteijn, 2016) argue that sharing and interaction help to create social support and develop social relationships, for instance, self-trackers seek support from others. This brings enjoyment and sharable achievements through social communications in self-tracking practices. However, seeing and communicating about data with others can also evoke feelings of competition, when people compare their own past data with current data or compare their data with others' (Kent, 2020b; Lomborg and Frandsen, 2016). The competition can be pleasurable or unpleasant, depending on how individuals engage with the practices of sharing data. It can be friendly competition to check each other's previously shared data (Lomborg and Frandsen, 2016). In this sense, comparison acts as mutual encouragement of carrying out self-tracking. Serious rivalries also exist in competitive events, which could lead to comparisons between self-trackers. The findings in existing studies (Lupton, 2017; Pantzar and Ruckenstein, 2015) suggest that people compare their historical data to push themselves to break previous records when they take part in competitions, in which case they may care about their short-term data histories rather than looking back on data once they have finished the competitive events. Feeling competitive with happens in the context of physical activities such as running and cycling. In the cycling study by Lupton and colleagues (2018), one participant who tracked his running and swimming activities for a triathlon compared his data with other users. He took pride in sharing his tracking data on social data via the app and was interested in comparing data with others to check whether he finished the training in good time. Another participant tracked her data and shared them on Strava, and then kept "a close eye on these people's data and comparing their achievements with hers" (p.658), especially followers whom she could never beat in a race (Lupton et al., 2018).

Some studies suggest that self-trackers interact with people they are close to, and share data-related stories with circumscribed private small groups who they are close to and know,

rather than publicly with everybody (Kristensen et al., 2021; Lomborg et al., 2018; Weiner et al., 2020). Kate Weiner and others (2020) explore how people share their data in everyday life and suggest that self-trackers tend to share their weight and BMI data privately with intimate partners, friends, and family members at home, or share about self-tracking data on WhatsApp groups. Kristensen (2021) agrees with Weiner's point that sharing data and interpretation of data among people with familiar relationships such as training friends in the gym occurs in a physical co-presence, which allows them to openly mutual communicate about their personal data with each other. Lomborg and colleagues (2018) argue that it is rare for some people to share data with others publicly, as the data are considered to belong to the private sphere. However, they suggest that several participants did share their data with others privately: one participant shared with her personal coach to prepare for contests and the other shared with her ex-boyfriend for occasional short chats about running improvements.

Several researchers (Fiore-Gartland and Neff, 2015; Ruckenstein, 2015; Sharon and Zandbergen, 2017) have noted that self-tracking data are useful as a communicative aid for patients to describe their inaccessible feelings, comparing current issues with the past, and sharing their private experiences with doctors in a healthcare context. Lupton (2015) points out that some people only share data with partners and doctors. Thus, self-tracking data are often kept private and made visible only to certain people. The discussion about privacy of self-tracking data has been focused on who is shared with and how the data are shared. Yet little attention has been paid to what types of data are shared privately in which contexts, whether all the data are private, and what data are shared publicly on Chinese social media platforms. I explore these aspects of sharing data in this thesis, as Chinese self-trackers' concerns about privacy and their personal self-tracking data might correspond or differ with those who have been studied in the West.

Overall, this section has discussed the meanings of sharing self-tracking from three aspects. Sharing is the act of interpretation of data, and it produces encouragement, support, peer reminders, and competition through social communication. The idea of sharing as self-documentation on social media clarifies that everyday life has been mediated and documented online. This explains why it is necessary to investigate sharing of self-tracking data, since it is embedded in people's everyday lives. This section also discussed social and communicative meanings of self-tracking that demonstrate construction of self-trackers' identities and social interactions through data. Sharing data with other people and self-trackers often facilitates self-tracking practices and achieves goals. The sense of personal self-tracking data is regarded as communicative data when people engage with the communication and social aspects of self-tracking. This part of the literature review relates to the third research question: *how do Chinese self-trackers share and communicate about their self-tracking practices?*

2.5 Digital Self-Tracking Research in China

There are few digital self-tracking studies based on China and the existing research is not empirical or very sociological. In recent years, theoretical and empirical studies about digital self-tracking in China have taken their concepts from Western research. Furthermore, Chinese research in multiple disciplines (including marketing studies, human-computer interaction studies, information studies, and health sciences) looks for the positive effects of self-tracking technologies on users and attempts to develop such technologies and solve issues. There is no sociological research on the subject, particularly critically considering the self-tracking phenomenon from the users' side.

A brief review of the literature in these disciplinaries is necessary to discuss Chinese digital self-tracking research in non-sociological studies. Although the literature is less relevant to the current project, it clearly illustrates how self-tracking in China is relatively new and needs more empirical studies, particularly from a sociological point of view. These studies also add some Chinese societal and cultural contexts to digital self-tracking scholarship. Thus, the second section explores how Chinese contexts are associated with digital self-tracking practices. Such contexts form the theoretical foundation for my understanding of what digital self-tracking practices and data mean to ordinary people in these contexts. Discussion of existing Chinese self-tracking studies suggests that this project can fill this literature gap in China from a sociological perspective.

2.5.1 Research benefits of digital self-tracking technologies in non-sociological disciplinaries

Chinese self-tracking scholarship focuses on self-tracking technologies, marketing, health, and illness across different disciplinaries. Many claims have been made based on analysis of the actual devices and marketing (e.g. Cho et al., 2020; Dongjin and Yudong, 2018; Gui et al., 2017; Lu et al., 2021b; Zhang and Xu, 2020). Many researchers in these fields study how to improve such technologies, how to attract users, and how to change their behaviours and lives. They celebrate data-driven calculation, optimisation, self-management and the 'quantified self' benefits of digital self-tracking devices and apps (Li and Yudong, 2018). They believe that data can tell people the truth about their bodies and make their lives and bodies visible and manageable. Their work attempts to study technical issues to contribute to sustained technological development, users' behavioural improvements, and health-related issues.

Promotion of sustained usage of digital self-tracking technologies

Most studies about people's experiences of using digital self-tracking technologies promote sustained usage and design of digital self-tracking technologies but focus on different aspects. For example, Yudong Zhang (Dongjin and Yudong, 2018; Zhang et al., 2020; Zhang et al., 2019) has co-authored several papers with other researchers and investigated the concept of

self-tracking in studies of customer behaviour by applying relevant marketing theories. Their aims are to attract new customers and retain existing users by improving self-tracking technologies and customers' motivations to engage with them. In their work on the self-tracking of consumption in China, Dongjin and Yudong (2018) identify "obstructive factors" of consumers' engagement with self-tracking technologies, explore the effects of self-tracking on consumers' participations and behaviours, and investigate the influences of design and quality of self-tracking devices and apps on the changes and improvements of consumers' behaviours.

Their work adds to explanations about the concept of self-tracking from other Western researchers such as Swan (2012, 2013), Lupton (2016) and Sharon and Zandbergen (2017). Dongjin and Yudong (2018) describe self-tracking as a process in which consumers self-track biological, behavioural, and environmental data in order to improve self-perception, self-awareness, and self-performance at both individual and community levels. Their findings illustrate that self-tracking behaviours involving self-management and self-improvement rely on continuous participation in self-tracking by shaping self-knowledge in a long term.

In studies in the field of app design, the concept of self-tracking is understood in the same way as the marketing definition. Researchers in this field celebrate the positive effects of self-tracking on individuals, lifestyles, and societies, and provide strategies to increase customer retention. App design studies have been concerned with how to optimise self-trackers' experiences, promote behavioural changes, and improve the public image of self-tracking app brands. They focus on the designs of interfaces and data visualisations of apps. Jia and colleagues (2019) suggest that the design of self-tracking apps can reduce mental workloads of customers and present more accurate self-tracking data. Using four case studies (Yue Pao Quan, Keep, iPhone Activity, and Nike+ Running apps), Long and Yan (2017) highlight the importance of data visualisation to QS and analyse visual forms, such as types of static and dynamic graphs, colours of icons, styles of visual elements, and other parameters.

App design studies have never considered the real experiences and thoughts of users from a sociological perspective. However, these studies have used the most popular self-tracking apps in China, such as JoyRun and Keep. This is beneficial for identifying what kind of self-tracking activities and specific devices and apps should be chosen in the methodological section of the present research, particularly for online textual analysis. Moreover, the analysis of interfaces and the data visualisation design of apps help not only in generating interview questions for the empirical work, but also in analysing materials that participants shared with me in relation to self-tracking data in repeat interviews.

These empirical studies demonstrate several common features. Firstly, they focus on the positive effects of the technologies on people's behaviours and aim to maximise profits for corporations. Secondly, their main research goal is to survey as many people as possible to collect their personal data for developing and improving the self-tracking technologies and services. Thirdly, research has mostly focused on tracking fitness and food, although weight and menstruation cycles have been studied by several researchers. Also, the samples in these

research projects related to digital self-tracking all illustrate that most self-tracking users are young Chinese people.

Insights from these empirical studies contrast with findings in the selected Western literature discussed earlier. Their research goal is to keep the attention of users and to attract more self-trackers, while Didžiokaitė and colleagues (2018a, 2018b) emphasise that in daily life, everyday self-trackers tend to use the devices and apps temporarily and may stop using them at any time. In terms of awareness, self-tracking studies in the West suggest that long-term continuous self-tracking is unnecessary or not sought by regular users.

Behavioural changes

Social aspects of self-tracking have been also studied by Chinese scholars. Many (Lu et al., 2021b; Tu et al., 2019) agree that the social aspect of self-tracking can motivate people to continue using the technologies and encourage them to sustainably participate in activities. Arguments around behavioural changes using self-tracking technologies have focused on promoting users' healthy behaviours and good lifestyles. For example, in marketing studies, Tu and his co-authors (2019) argue that self-tracking fitness apps can help people to continue exercising and incorporating good walking habits into their everyday life. Similarly, in human-computer interaction research on the social aspect of tracking food and diet, Lu and colleagues' (2021b) research model suggests a combination of Chinese food tracking apps and social platforms such as Weibo, Moments on WeChat and Douyin (a Chinese version of Tiktok) benefits the development of a healthy diet and eating habits to sustainably build healthy behaviours in the long term. These studies demonstrate how Chinese people use such technologies and where and how they share things in relation to self-tracking on social media.

Only one academic paper has discussed self-tracking in society and culture (particularly youth culture) (Liang and Shi, 2014). Although it begins by being concerned with users, it mainly links self-tracking culture with the broad social media culture for young people in order to detail the positive and negative effects of digital culture. According to Liang and Shi (2014), self-tracking is seen as a data-driven behaviour through which individuals monitor themselves to gain everyday living data via wearable devices. They stress that self-tracking technology has attracted many young users aged between 20 and 30. In addition, they link the concept of self-tracking to other notions such as 'data-sexuals' or 'data junkies'. The term 'data-sexual' (Basulto, 2012) is the digital equivalent of the cultural notion of 'metrosexual': data-sexuals record everything about their personal lives and think that their data is 'sexy'. This concept is similar to 'data fetishists' in the study of critical self-tracking by Sharon and Zandbergen (2017). Liang and Shi (2014) state that QSers are a type of data-sexual, as they are crazy about or addicted to self-tracking data. Also, they state that QSers are like active users of social media. Social media users and QSers regularly record their lives as data: social media users record their behaviours by sharing their lives on social media, and QSers record their behaviours and lives using technology. The focus of this study is on the negative influences of self-tracking data on young people without empirical evidence to support their opinions.

The purpose of research on social self-tracking in these Chinese studies differ from those of Western researchers (Kent, 2018, 2020b; Lomborg and Frandsen, 2016) who focus on the social meaning of self-tracking practices for individuals, as discussed above. They emphasise the importance of individuals in sharing practices in relation to self-tracking, while Chinese researchers highlight the effects of the social value of technologies on people. My research aims to critically look at how individuals apply their own agency in self-tracking and data sharing practices, rather than how they are changed by such practices. Although the literature cannot be used as theoretical evidence for my study, it provides a picture of everyday self-tracking practices in China. It helps me understand what self-tracking apps Chinese people use, what activities they track, and which Chinese social media platforms they engage with in relation to self-tracking. Therefore, this thesis can contribute to the self-tracking scholarship in China from a sociological perspective, particular around various types of self-tracking practices.

Healthcare and illness management

Chinese researchers in information studies, health science, and medical studies focus on the contributions of self-tracking technologies to healthcare, disease prevention, and illness management. Benefits of the technologies for health and illness have been noted by many Chinese scholars. In a biological research project about tracking women's period-related parameters on the Huawei wristband 5, Yu and others (Yu et al., 2022) tested the wearable device's prediction algorithms and call for apps to help female users with irregular periods to predict their menstruation cycles accurately. They point out that personal self-tracking data has benefited clinical medicine. In a public health study, researchers (Li et al., 2019) reviewed the functions of Chinese diabetes trackers and argued that current apps need to be improved for better diabetes self-management. In a health communication study examining the technical features of fitness apps, Huang and Zhou (2018) suggest the design of such apps benefit behavioural changes and promotion of physical exercises and highlight how the development of new apps needs to be connected to existing digital platforms and social communities.

Information studies researchers discuss the applications of self-tracking in health. For example, Liu and Ju (2018) show how self-tracking heath datasets integrate diverse health-related data produced through mobile terminals and wearable devices from hospitals, public healthcare and online health communities to help users improve their health, lifestyles and medical health management. Although this research has little relevance to my research, it refers to broad national policy expectations, such as the national health policies and health issues in Chinese society detailed at the end of their paper. Liu and Ju (2018) point out the positive effects of self-tracking datasets, which are useful in developing electronic healthcare and telemedicine, reducing healthcare costs and the frequency of clinic treatment at an individual level, and increasing the awareness of a healthy lifestyle and promoting chronic illness management in elderly people. Similarly, Zhu and colleagues (2018) highlight the positive influences of self-tracking data with ordinary users and people with chronic diseases

through utilising wearable devices and apps for better communication between doctors and patients with chronic diseases.

These studies have examined the benefits and issues of self-tracking apps in relation to people's health and illness rather than discuss users' perceptions of their health management. The studies have culturally referred to proposed policies and potential health issues in China. This social context explains why people use such technologies in China, which helps to explain why my research is meaningful for citizens and society in China.

To sum up, literature in this section tend to conclude similar assertions that in China, self-tracking can be significantly affected by culture, business, living standards, and society in many different ways. The power of individual agency is unrecognised. Although one paper (Liang and Shi, 2014) in cultural studies suggests some negative influences of the practices of recording lives on young people, the purpose of such research is generally to find solutions to issues and benefits from using such technologies in a better way.

2.5.2 Chinese cultural contexts emerging in digital self-tracking studies

Within the existing Chinese self-tracking literature, some studies apply Chinese culture to investigate self-tracking phenomena in China. It can demonstrate some of the similarities and differences in digital self-tracking studies between China and other countries (e.g. Australia, the UK and Finland where digital self-tracking culture has been sociologically studied for a decade). This section provides a brief sketch of Chinese culture as the research context, including 'suboptimal health' (亚健康) and 'yangsheng' (养生), which are related to Chinese medical culture. Both contexts are essential in Chinse traditions, although other contexts have also been discussed in Chinese self-tracking studies, such as menstruation cycle culture and beauty culture. This section briefly discusses both 'suboptimal health' and 'yangsheng' – more detail is given along with the data analysis in later empirical chapters. Other relevant societal and cultural contexts such as working culture will be analysed further in the data analysis chapters of this thesis.

In the definition of digital self-tracking discussed in Chapter One, health is seen as one of the key areas that benefits from self-tracking, through practices of self-care, self-management, health promotion, and developing good lifestyles. Self-tracking for health purposes can be situated in the ideology of 'suboptimal health' in Chinese medical culture. Chinese medical researchers identify 'suboptimal health' as a bodily state between disease and health (Bi et al., 2014; Bi et al., 2019; Qian, 2005; Zhang and Shao, 2015). It refers to physical symptoms (such as bodily struggles with adjustment to a living environment and weakness of energy, liveliness and strength), and psychological symptoms (such as stress, anxiety and decreased social adaptability) (Jiang et al., 2021; Qian, 2005). According to Bunkenborg (2014), in his study of subhealth and quality of bodies in contemporary China, the notion of 'suboptimal health' has been discussed in terms of poor 'quality' (素质) of bodies whereby people experience vague "bio-psycho-social manifestations of subhealth" (p.129) such as insomnia

or hair loss. He argues that this concept corresponds with governmental concerns with the social issue of Chinese citizens' lacking good 'bodily quality' (身体素质), which could be seen from a range of governmental health policies as discussed in Chapter One.

Existing studies about 'suboptimal health' suggest Chinese people increasingly find themselves in the poor subhealth status (Bi et al., 2019; Guo and Lin, 2008; Pan et al., 2021). For instance, Pan and colleagues (2021) suggest that 63.7% of people among 16,820 participants had subhealth issues during the COVID-19 pandemic in March 2020. They call to pay more attention to certain groups of people who have relatively higher risks of 'suboptimal health' in China, such as urban people and men (Bi et al., 2019). In the empirical data analysis of this thesis, the concept of 'suboptimal health' is important for understanding self-tracking motivations, methods of self-tracking, feelings about data and bodies, and shared content on social media.

Jiang and colleagues (2021) call for prevention of subhealth by raising people's self-awareness of subhealth risks, and some studies suggest that self-tracking can play a role in doing this. A Chinese study of diabetes self-management in groups of elderly people (Gao et al., 2017) suggests that self-tracking applications encourage users to achieve and maintain various health states such as good sexual health, healthy bodyweight, and depression prevention, by providing early-warnings of physical and mental symptoms. In another Chinese study about the creation and examination of a mobile application named RegiBot for monitoring facial conditions to assess everyday health conditions, Jiang and co-authors (2022) suggest that people use RegiBot as a self-tracking app to regularly track health to maintain healthy habits, and that those who follow the food-related information recommended by the app could help with subhealth problems in everyday life. This study suggests that self-tracking is used by Chinese people to address their subhealth issues, and that everyday self-tracking contributes to health prevention in busy lives before diseases occur. The knowledge and information that is built into such technologies demonstrate Chinese 'yangsheng' (养生) culture.

'Yangsheng' is about maintaining, improving, and preventing poor health in the Chinese society and medical research. According to Sun (2016), 'yangsheng' is commonly referred to as "'life nurturance', 'health cultivation', or 'wellness promotion'" (p.67). It refers to a range of things that benefit people's health from consumption of food, supplements and drink to sleep patterns and exercise styles, and from ways of taking care of bodies to living environment (Sun, 2016). Almost every person in China has at least some knowledge about how to 'yangsheng', which has been an essential part of Chinese culture (Sun, 2016). 'Yangsheng' is not just about healthy lifestyles, but also strategies of health prevention to deal with specific diseases (Han and Zheng, 2005) as well as health and subhealth problems. As a result, 'yangsheng' is closely related to people's everyday lifestyles and health conditions. I use both 'suboptimal health' and 'yangsheng' as a conceptual approach to gain insight into analysis of individuals' explanations of the relations between their self-tracking data, daily lives, and their decision-making in China.

As noted above, issues involved in 'suboptimal health' statuses and 'yangsheng' practices are relevant to self-tracking activities. For example, 'yangsheng' encourages consumption of foods containing vitamins and minerals, healthy breakfasts, and avoiding fatty food and deep-fried food (Sun, 2015, 2016). Similarly, in self-tracking food practices, researchers emphasise that people navigate everyday eating such as planning meals and nutrition intake to increase healthy eating and well-being via self-tracking devices and apps (Boztepe and Berg, 2020; Kent, 2021). Such relations between 'yangsheng', 'suboptimal health', and self-tracking also demonstrate other aspects of mundane lives, such as menstruation cycles and exercise, which will be all discussed throughout the thesis.

Although there is no sociological research on self-tracking in the contexts of 'suboptimal health' or 'yangsheng', the examples above, undertaken within medical studies and computer sciences, have shown their interrelations in terms of health, bodies, and everyday lives. Discussion of cultural backgrounds contributes to an understanding of Chinese self-trackers' choices, experiences and feelings in digital self-tracking practices in this study. Although many interview participants in this study did not explicitly mention 'suboptimal health', their experiences suggested that many were in sub-healthy states or considered their sub-healthy body conditions when they self-tracked.

In this section, I discussed Chinese self-tracking research to explain three focuses on self-tracking in different disciplines in China, including strategies for developing sustained usage of self-tracking technologies, and benefits of such technologies for users' behavioural changes and health management. Given the work these researchers have done demonstrates the absence of self-tracking in China in the scholarship from a sociological perspective. It is essential to discover individuals' perceptions of how they encounter self-tracking in their everyday lives, a subject which has been ignored in studies celebrating the development of such technologies and their positive effects on users in China. Two key Chinese cultural contexts have been discussed in this section to help understand how self-trackers in China track differently from people who have been studied in the Western self-tracking literature.

2.6 Conclusion

The literature review has discussed the development of self-tracking research. There have been changes of research focus in this field from marketing and ethnographic studies of self-tracking to everyday self-tracking. Early ethnographic work on self-tracking initially focused on the 'Quantified Self' (QS) movement and community (a community of committed self-trackers who share their tracking experiences in local groups and at conferences), which provided various understandings, analyses, and valuations of self-tracking data. Being aware of this research background, it is useful to learn about how and why scholars start to draw attention to this type of technology in the commercial market. The literature review has discussed how scholars have shifted their interests to 'everyday self-tracking' beyond QS as they argued that the insights from studying QS self-tracking cannot fully represent the experiences and thoughts of 'ordinary users'.

The literature has suggested that different people track different things using different types of tracking activities. This section pointed out the absence of comparative research into the diversity of everyday digital self-tracking. This is one of the central focuses of the current project, captured in RQ1: *what differences matter in Chinese self-trackers tracking activities?* The second section highlighted feelings about self-tracking practices and data. It discussed meanings of feelings in existing studies and developed the definitions of this concept. Feelings in this study were divided into three types: emotions, bodily sensations, and sensory responses. This section also provided an overview of feelings that has emerged in previous studies to serve to understand how self-trackers feel similarly and differently in the West and China. As such, this section led to addressing RQ2: how do Chinese self-trackers feel about their different self-tracking practices and data? and RQ4: do themes (identified in the literature review) apply in the Chinese context, or do new themes emerge, and how do the findings relate to current scholarship?

The third section of the literature review highlighted the social and communication functions of sharing self-tracking data. It integrated sharing literature in social media studies and literature about sharing self-tracking in self-tracking studies to discuss three aspects: self-documentation, self-representation, and social interactions. This allowed me to explore sharing and communication meanings of self-tracking in this study, which relates to RQ3: how do Chinese self-trackers share and communicate about their self-tracking practices and what do they share and communicate? Finally, the literature review highlighted current research gaps in terms of self-tracking research in China. It focused on self-tracking research in China in different disciplines and two Chinese cultural contexts to highlight the importance of this research in the Chinese context as a sociological study. This section aims to help address RQ4.

The first three research questions relate to themes identified in three sections of the literature review, while the fourth is a broader question about whether these themes remain relevant when I examine diverse self-tracking practices within the remit of self-tracking in China. Most self-tracking studies discussed above were based in the West; little work in this area has focused specifically on China. Even though more researchers have started to pay attention to it, most of their studies only represent theoretical discussions. Researching self-tracking in China is a field in its early stages, so little in the way of empirical discussion has been carried out. To answer these questions, I introduce the research design in the next chapter before moving on to analytic empirical discussion.

Chapter 3 Methodology

3.1 Introduction

This chapter explains the methodology and the research process followed in this project. It focuses on the research design and methods I used to answer my research questions. This research uses a qualitative and quantitative mixed-methods approach, incorporating interviews with the object elicitation method (in terms of screenshots of self-tracking data that are captured by interview participants in their self-tracking apps), and digital methods aided by semantic network analysis. The chapter outlines how I chose the research methods and how I collected and analysed the data to answer my four research questions.

The chapter starts with research aims and the research questions, which aim to fill the knowledge gaps identified in the literature review. It then explains the rationale of the overall research approach for this empirical study. In the two subsequent sections, I discuss each of the chosen methods in detail. First, I discuss the data collection using interviews, which incorporated material methods. This section also reflects on other issues relating to the interviews I carried out, including recruitment strategies, interviewing online, an overview of participants, and how I approached thematic analysis. I then focus on semantic network analysis, including data collection, my resultant sample, my approach to analysis of text data and the techniques for analysis. The chapter finally ends with discussion about ethical considerations.

3.2 Research Aims and Questions

The literature review showed that existing studies discuss what people track, how they feel about self-tracking, and what they share about it on social media. Most studies focus on one type of digital self-tracking, feelings about it, and representation and communication about self-tracking on Western social media platforms. However, I argue that people track differently and feel differently about various self-tracking activities, as outlined in Chapter Two. The central aim of this study is to explore experiences, feelings, and understandings of Chinese self-trackers in relation to their self-tracking practices and data, in the context of different self-tracking activities, carried out using different digital devices and apps in China. Specifically, it investigates how Chinese self-trackers make sense of and what they feel about their data. Also, it aims to develop a better understanding of Chinese everyday self-tracking and to bring new knowledge to both Chinese and Western digital self-tracking studies. To achieve these aims, the core research questions are:

> RQ1: What differences matter in Chinese self-trackers' tracking activities?
>
> RQ2: How do Chinese self-trackers feel about their different self-tracking practices and data?

RQ3: How do Chinese self-trackers share and communicate about their self-tracking practices? What do they share and communicate?

RQ4: Do themes (identified in the literature review) apply in the Chinese context, or do new themes emerge? How do the findings relate to current scholarship?

In the section that follows, I describe my methodological approach to answering these questions.

3.3 Rationale of Qualitative and Quantitative Research Approaches

This is a project where questions are asked about the 'what' and 'how' of people's experiences and feelings of everyday self-tracking practices and of their related sharing on social media. Therefore, I considered an appropriate methodological approach that could procure a deep understanding of individuals' personal everyday self-tracking stories and of their shared online content. I concluded that a mixed qualitative and quantitative methodological approach is needed to combine and compare offline (in interviews) and online (on social media) self-interpretations of the same research topic (Olsen et al., 2004) and to collect research data that one method could not achieve alone (Kim, 2019).

Therefore, I suggest that interviews and semantic network analysis methods in this study are complementary to each other to help me achieve an integrated analysis of self-trackers' practices, feelings, and thoughts. Methods are divided into two core components. First, I conducted interviews and repeat interviews incorporating object elicitation method with self-trackers in China who use self-tracking devices or apps. Object elicitation method in this research means that my interview participants who agreed to participate repeat interviews took screenshots of their self-tracking data from their devices and apps, sent them to me in advance and discussed about them during repeat interviews. This was aimed to address the first three research questions and interview data is used throughout the thesis. Second, I used semantic network analysis to discover the online expressions about everyday self-tracking in China on Sina Weibo. This was mainly used to answer the third research question about sharing self-tracking data. However, some original posts are used as examples to help develop arguments and discussions in all empirical chapters when needed.

The interview method helps me to investigate detailed descriptive explanations of people's experiences, feelings, and understandings of self-tracking practices and their data. After the first round of initial interviews, repeat interviews with material methods were conducted to obtain more detailed accounts of participants' experiences, feelings, and perceptions about everyday self-tracking during one-month period after initial interviews. Repeat interviews helped me to further investigate the unique experiences of each interview participant. Repeat interviews offered opportunities for me to address follow-up questions that arose as I analysed data from the initial interviews.

Material methods were used in the repeat interviews in the research. One of the challenges for this study was that feelings can be difficult to describe and remember for some participants. Some of my participants talked about their experiences but had less awareness of their feelings about their self-tracking data. This tended to limit my ability to gain insight into tacit or embodied elements of everyday practices. Furthermore, Woodward (2001) has highlighted the issue of the relationship between what participants say and what they actually do. Therefore, the object elicitation method was used to help elicit recollection of everyday practices, including feelings (Harper, 2002; Weiner and Will, 2015). Materials in this research were screenshots of self-tracking data that were produced on devices and apps – I call this the object elicitation method.

The interview method began before data collection from Weibo, as interviews could give me a detailed understanding of what people tracked in the real world by talking to them directly. Although many interview participants expressed that they rarely shared their data publicly on social media and preferred to share privately either online or offline, there were many online posts in relation to self-tracking on Weibo. This was the other important reason for undertaking data collection on Weibo with a semantic network analysis approach: to investigate what and how people talked about self-tracking online and what new themes emerged online in relation to meanings of self-tracking and data. This digital approach contributed to answering RQ3 and provided a better understanding of everyday self-tracking practices and feelings about self-tracking data through online content on Weibo.

In short, the mixed material interview method with semantic network analysis allowed me to simultaneously capture people's verbal expressions and to interpret the meanings of written expressions (Basov et al., 2021) on Weibo in relation to the same research topic of self-tracking in everyday life. In the following two sections, I provide the rationale for choosing these methods and explain the phases of conducting each method and related data analysis.

3.4 Interviews

3.4.1 Interviews and repeat interviews with object elicitation methods

Interviews enable participants to share contextually meaningful stories and "unravel the complexity" (Rubin and Rubin, 2005, p.134) of their everyday self-tracking lives. They allow participants to verbally address feelings about their data. This method is a good way to explore everyday life and personal perceptions and feelings and has been used in a range of related research fields, such as sociology of everyday life, sociology of emotions and sociology of data. It can be used to investigate individuals' experiences, emotions and lives (Gubrium et al., 2012), as it creates a space in which people can speak about their own experiences.

Interviews are useful to determine how people describe their self-tracking experiences and perspectives in detail (Ruckenstein, 2014) and to prompt their descriptive accounts. Interview

conversations can cover people's thoughts, understandings, and feelings towards their data-producing experiences and the meanings of the data. To investigate their subjective interpretation and narratives (Bryman, 2016), in-depth conversations with participants can be conducted and guided according to research objectives (Kvale, 1994).

In the initial round of interviews, participants showed me devices, apps, and data, as they enabled them to speak about their self-tracking experiences. While I did not ask or expect participants to share these materials, they did so spontaneously. Similarly, participants in the pilot study and two initial face-to-face interviews voluntarily showed me these kinds of materials too. They introduced the functions that they did or did not use, explained the data they produced, viewed, ignored, and emotionally engaged with, and selected certain materials as examples to help them continue conversations. Screenshots were also voluntarily shared by participants during online interviews, as discussed later in this section, when we discussed their experiences and feelings about data. Sharing materials like these in interviews made it easier for them to describe their experiences and ideas during ongoing conversations. These materials helped participants explain how they used, felt, understood, and shared in relation to self-tracking.

Besides benefits for participants, materials were helpful for me as a researcher. I did not request participants to show their devices, apps, and data at the beginning of interviews due to privacy concerns, until they felt confident enough to show me. According to Holmes (2020), it might cause discomfort to participants if they are asked to show their self-tracking data, regarded by many participants as private materials. Seeing interfaces, data and screenshots was helpful for me to ask follow-up questions and guide participants to talk about certain functions and data that they might pay little attention to or had not thought about until I asked. Sometimes, during online interviews, it was difficult for me to imagine how participants used devices and apps that I was not familiar with, even though they described them in detail. Once participants provided screenshots as examples, I immediately understood their descriptions and it saved time to move on to other topics. Despite these benefits of showing or sending materials, the flow of conversation was interrupted when participants searched for items or were taking screenshots. I wrote notes to remind myself of the ongoing conversations to avoid losing the thread of discussion topics.

Repeat interviews

Repeat interviews enable to seek new, different, detailed explanations (Rubin and Rubin, 2005) of and reflexivity about their self-tracking activities and the data. Repeat interviews are beneficial for researchers to develop understanding, and to seek clarification or additional information related to issues raised in the initial interviews (Vincent, 2013). Participants had more feelings to discuss than they shared in the initial interviews; using their self-tracking data and visualisations as elicitation devices encouraged them to share more relevant information. Repeat interviews are also appropriate when it comes to dealing with sensitive issues (Vincent, 2013) such as bodies and their functions. Thus, building on a high degree of

trust established with participants in the first interviews, repeat interviews are able to obtain richer, more in-depth, valuable data.

Allowing short periods between interviews could result in them bringing less valuable information to repeat interviews, while long intervals might prove difficult in terms of retaining their participation in the final research stage. Therefore, one month was considered to be a suitable time between interviews. A new interview topic guide (see Appendix 3) was created for the repeat interviews, based on conversations in the initial interviews. For example, if a participant said that they did not share their self-tracking after the initial interview, the topic of sharing was excluded in the repeat interview guide.

Ten repeat interviews were carried out during the fieldwork. At the end of each initial interview, I asked whether participants would continue self-tracking. I did not invite four participants to participate in repeat interviews, as they showed no interest in self-tracking in the future for different reasons. Four participants cancelled repeat interviews due to their busy work schedules and studies, while one participant cancelled but later changed his mind. Another three participants were not sure whether they would continue self-tracking or not due to personal issues and eventually did not take part, as they started to work in their offices again after COVID-19 and had less time for self-tracking after lockdown was eased.

All participants gave permission for me to look at their posts on Moments on WeChat if they published anything about self-tracking. The posts were treated as contexts for discussions in repeat interviews and counted as research data. I used all types of materials (including screenshots of self-tracking data and posts on Moments on WeChat) as prompts in the follow-up interviews. Zoe used to close her previous posts published on the Moments on WeChat, and after the initial interview, she contacted me to say that I was welcome to look through her previous posts about self-tracking and agreed to me using them in my research data.

Repeat interviews lasted up to 2 hours, with an average length of 90 minutes. During repeat interviews, after a short chat about any changes to participants' self-tracking practices in the last month, the following conversation was based on screenshots that they had sent me. I asked questions about self-tracking practices (how, what, and why), their interpretations of data and data visualisations, and attitudes and feelings about data accuracy and data-related privacy. Most participants were visibly confident about recalling their experiences, describing their feelings about practices and data, and remembering the practical and emotional narratives that they experienced in specific situations. These materials helped participants to give detailed descriptions and produced good quality interview data compared to initial interviews, which provided more general descriptions.

Additionally, some participants sent screenshots and information between initial and repeat interviews. This helped to start a short chat with participants about their everyday lives and self-tracking practices beyond previous formal interviews. To show my respect for participants, I always responded to them with understanding and positivity, which helped our chats begin. Some participants gave extra personal information that they might not have comfortably talked about in the first interviews, such as their illness histories (depression,

cancer, eating disorder) and present difficult situations (such as struggling with sleep). It was also a good way to bring out the different sides of participants' personalities. For example, some participants explained why they were not interested in sharing about self-tracking, such as generally disliking sharing, sharing with strangers, or sharing publicly. In contrast, they seemed to enjoy sharing their data with me, sending fun stickers or being keen to talk about their experiences and data in more detail. These interactions with participants built trust, developed good relationships with them, and encouraged them to feel more relaxed and comfortable in repeat interviews.

Object elicitation method

Interviewees have different abilities to recall and reflect on their beliefs, feelings and experiences, and their subjective tacit understandings are likely challenged by being asked to explain them to a researcher. These possibilities can influence the value and quality of traditional interviews. Elicitation techniques can overcome the limitations of the traditional interview method. One common technique is the object elicitation interviewing method, as used by sociologists such as Weiner and her colleagues (2020) in their self-tracking studies. They conducted in-depth interviews with photo elicitation to explore self-monitoring. This inspired me to look for a type of material to elicit my participants' understandings, interpretations, and responses in relation to self-tracking.

In this research screenshots were used as elicitation objects in repeat interviews. Screenshots of self-tracking activity contained owners' memories and can "reveal a narrative" (Holmes, 2020, p.71) of self-trackers' everyday lives and connect their data to them. Johnson and Weller (2002) suggest that researchers can let people relate to the visual materials, ask them to describe the visual content, and express their feelings about them. It allows for an exploration of the meanings of objects for participants in their everyday lives (Holmes, 2020). Material methods helped interview participants reflect on their subjective feelings towards their self-tracking data (Tilley, 2001). Objects play a role in identity construction (Digby, 2006) and act as a means of linking memories, stories and identities (Horton and Kraftl, 2012; Roberts, 2012). Engagement with repeat interviews and sharing screenshots enabled me to explore participants' deeper experiences and responses to digital self-tracking, and to examine any changes during this month between interviews.

The ten participants who agreed to be re-interviewed provided me with screenshots of self-tracking data that was produced using their devices/apps approximately one month after their first interviews. The participants were given two options for sharing screenshots: weekly or daily. Half of the participants (Xinyue, Xiao, Tiyu, Zeyu, and Yan) sent their screenshots once they recorded or reviewed their data; the other half sent them every seven days. I numbered all screenshots each participant sent me and saved them in a PDF file. I sent the file to each participant in advance of repeat interviews and reminded them to check the visual materials for discussion in the repeat interviews.

Although screenshot elicitation was the main approach to carrying out repeat interviews, six participants showed other types of materials as well, including photos, videos and app interfaces, during video interviews through WeChat. Screenshots included interfaces of devices and apps and data histories, often along with data visualisations, and posts published on Moments on WeChat and Sina Weibo. Photos were taken by five participants in relation to their hard-copy self-tracking records, some content of diaries related to self-tracking, and moments of tracking activities. All these materials were included as research data and used as evidence in the following empirical chapters.

The object interview approach helps participants talk about ordinary things that they do every day but give little attention to. It is a way for researchers to understand and make sense of people's everyday lives (Holmes, 2020). It was convenient for participants to take screenshots whenever they recorded and reviewed their self-tracking data, and beneficial for their verbal interpretations of self-tracking data and the flow and depth of our conversations.

3.4.2 Recruitment and participant overview

I combined snowball sampling with recruitment advertisements (see Table 3.1) on social media platforms, recruiting a total of 21 participants (see Table 3.2). I intended to recruit a diverse sample of 30 Chinese self-trackers who used at least one self-tracking device or app in everyday life and intended to continue using it in the future. Before each interview, I had an informal chat with the potential participant to check what devices and apps they used and whether they were still interested in self-tracking at the time of participation in this research. As this research studies different self-tracking practices, I recruited people who used different devices and apps and tracked different activities on purpose to achieve the research aim.

Recruitment Strategies	**Number of participants recruited**
Personal network on WeChat	14
Zhihu	4
Sina Weibo	2 (1 Weibo user and her offline friend)
Douban	0
Red	1

Table 3.1 Recruitment strategies and number of recruited interview participants

Conducting recruitment in this way was not very diverse but there was a good mix of genders at least. Initially I had planned to combine online and offline recruitment strategies to recruit potential participants. I had designed a leaflet and planned to hand it out in public places such as university campuses, gyms, residential communities, and restaurants. However, the COVID-19 pandemic began in December 2019 in China, shortly after I started my fieldwork. At that time, I had recruited two participants who agreed to be interviewed in person in Beijing. Due to COVID-19 restrictions, I lost the chance to recruit and interview potential participants and I was physically restricted to my hometown of Shuozhou city. Thus, the

face-to-face recruitment approach was no longer available and had to be abandoned. However, I continued to use multiple online strategies.

People who used at least one self-tracking technology in everyday life in China were approached through the following strategies. First, I sent recruitment advertisements through personal networks on social media to reach people located in different places (Gao et al., 2015; Zhu, 2019) and sent eligible contacts on WeChat the recruitment advertisements in November 2019, including friends, relatives, and family friends. I also advertised my recruitment information to 324 of my Chinese alumni who lived in China after graduation, from within our university groups from Leicester University, Sheffield University and LSE on WeChat. Many of them shared my advertisements to their own networks using the personal message function on WeChat (like WhatsApp, it allows people to have private audio and voice chats). They also voluntarily spread it through the Moments feature on WeChat (like Facebook's News Feed where people publish, comment, and 'like' posts). They encouraged people in their networks to share it broadly. I also posted the advertisements with my personal account on Moments on WeChat to gain attention from a wider personal network. This main strategy recruited 14 participants – three potential participants recruited this way withdrew from the study due to work, travel, or loss of interest in self-tracking. I was aware that this method likely recruited similar types of participants, particularly people like me. During the process of transcription, along with the ongoing recruitment, I noticed that many participants had master's degrees and were aged between 25 and 34, similar to me. Therefore, to balance ages and educational backgrounds, I reduced the recruitment through my personal network, stopped recruiting those with similar backgrounds to me, and focused attention on recruitment on social media, as described below.

While recruiting through personal networks, I also posted recruitment advertisements on four social media platforms (Zhihu, Douban, Red, and Sina Weibo). Purposive sampling through this method was intended to recruit those who often shared about self-tracking on social media. Social media is a space where potential participants represent themselves and share about their everyday self-tracking, as found in previous self-tracking studies (Dong et al., 2019; Liu, 2021). I acknowledge that this strategy might exclude those who never shared about self-tracking on social media or were not keen on using social media in general. It might limit the diversity of the interview sample and cause bias in the interview data. Despite these limitations, the social-media-based approach helped to overcome the limitations of snowball sampling via personal networks. It was an effective way to gather a wider range of participants who were different from participants recruited through personal networks.

Four social media platforms were selected as potential sites for recruitment. After observations on Douban and Zhihu, I targeted appropriate groups where people talked about topics such as weight loss, diet, and exercise. Douban is a social networking site where people who have the same interests build groups and communicate with each other (Shan et al., 2017). Zhihu is the Chinese version of Quora, where people can exchange knowledge and experiences in online groups (Chen and Deng, 2014). With group moderators' permission and their help with publishing recruitment advertisements on both platforms, I recruited six participants through the Zhihu platform (two subsequently withdrew), with no replies through

Douban. I also advertised the research through my personal accounts on Zhihu, Douban and the Red app, a place to share various aspects of everyday lives including self-tracking practices through photos and videos. Red was expected to be an ideal platform to recruit potential participants, as I sometimes received content recommended by this platform about people's everyday lives, self-tracking data, and relevant experiences. However, only one participant was interviewed, and two potential participants eventually withdrew.

While waiting for responses, I directly messaged a few social media users on Zhihu, Douban, and Sina Weibo and stated my research objective. I used keyword searches for activities as well as names of devices and apps, such as Snailsleep and Meetyou apps, and looked through social media users' previous posts about self-tracking. This helped me to quickly identify whether users might be useful potential participants. I sent invitations to 20 Douban users, 20 Zhihu users, and 50 Weibo users, through private messages. One Douban user who showed interest later withdrew their participation; one Zhihu user agreed to participate; and three Weibo users showed interest in the study. Only one Weibo user engaged with an interview, but she invited her friend to participate as well. In short, I generated a further seven interviewees through social media platforms.

Potential participants were given an information sheet to enable them to understand the research. They were provided with opportunities to ask any questions and they were advised that they could withdraw from the fieldwork at any time without giving any reasons (see Appendix 1). One participant communicated with me through my university email; the other potential participants all added me on WeChat. I sent consent forms by WeChat to help them understand the nature of the research project, the risks and benefits of their involvement, my data storage and data distribution policy and made them aware of the audio recording of interviews. I promised anonymity and confidentiality. The importance of ethical issues in fieldwork is paid less attention by researchers and participants in China than in the UK, and sometimes researchers can conduct projects without ethical approval. By explaining informed consent, I aimed to increase the ethical awareness of Chinese research participants for their participation in future research, to protect my participants' privacy and safety, and to build trust with them.

While answering potential participants' questions, I communicated with them about their basic self-tracking situations, including what devices or apps they used and how long they had been tracking. This aimed to confirm an appropriate potential sample before taking further steps to arrange and conduct the interviews. It also helped me identify the demographic characteristics of the sample in the ongoing recruitment stage for my purposive sampling. Having conversations with potential participants was also helpful for their decision-making about participation in the study. Several realised that they were not the right subjects and withdrew from the study. For example, some no longer used this type of technology while they were interested in chatting with me and reading the information sheet. Two only used WeRun but rarely paid attention to it, so they did not feel they had much to say about it and changed their minds about participating in the study.

Participants who accepted interviews were given opportunities to ask questions and were invited to read, sign, and return the informed consent forms (see Appendix 5) before the interviews. I offered a 100 RMB (£11.87) Jing Dong voucher to each of the 21 participants, and after initial interviews I offered an additional voucher of the same value for those who progressed to the repeat interviews.

I recruited and interviewed 21 participants, 10 of whom participated in repeat interviews (see Appendix 4). Initially, the intended sample was to be 30 individuals who lived in Beijing and currently used self-tracking technologies in everyday life. However, participants' locations were changed beyond Beijing due to the COVID-19 crisis and changes in personal lives. It was beneficial for the exploration of diversity of self-tracking to consider whether participants self-tracked differently in different locations. As summarised in Table 3.2, 11 participants were female and 10 were male, 20 had higher degrees and one had a college qualification, and they were aged 20 to 48 years, with the 25-34 age group being the biggest in the sample, followed by the 35-44 age range. Therefore, the majority of participants in my interview sample were from the younger age groups, aged 18-44 (see Table 3.2). Older age groups were less represented, likely due to the snowball sampling through my personal networks and the recruitment strategies employed. Many individuals in my personal networks were younger, and recruiting through social media platforms tended to reach a younger demographic. It is important to acknowledge the characteristics of my sample and understand my findings in relation to these.

Characteristics	Number of participants
Education	College: 1 Bachelor's: 8 Master's: 12
Employment status	Self-employed: 3 Employed: 16 Student: 2 [Unemployed: 2 (one found a job after the initial interview; one quit a job during the lockdown before the initial interview]
Age	18-24: 2 25-34: 13 35-44: 5 44+: 1
Gender	Women: 11 Men: 10
Health conditions mentioned by participants	Not mentioned: 8 Uncomfortable conditions (such as occasional shoulder pain): 2 Subhealth: 4 Illness (previous and nowadays): 7
Use of devices/apps before repeat interviews	One device/app (including use of the device and its bespoke app): 3 Two devices/apps: 8 More than two devices/apps: 10
Recruitment	Personal network: 14 Zhihu: 4 Red: 1 Sina Weibo: 2

Table 3.2: Demographic characteristics of the 21 participants

3.4.3 Conducting mixed offline and online interviews

Considering the volume of data expected and the limited time for data collection, I decided to reduce my initial plan of conducting 30 interviews to around 20, with 10 repeat interviews. I carried out 21 interviews that incorporated material methods to answer the four research questions, focusing on participants' everyday self-tracking experiences and their feelings in detail. The interview process included three stages.

I began with a pilot interview to test the feasibility of questions. Following the pilot, I added more questions, deleted a few, and made some changes to the initial interview guide to ensure that participants would find conversations easy. I also improved my interview skills around asking questions about feelings, which the participant felt difficult to talk about. For example, I tried to spend less time on the warmup questions and took their experiences and screenshots of data as examples to try to let them express their feelings, rather than asking direct questions (such as "how do you feel about viewing the data?").

Semi-structured interview topic schedules were used to guide conversations during initial and repeat interviews (see Appendices 2 and 3). They provided prompt questions but also allowed adaptation to each participant. For initial interviews, I developed a range of questions to cover six topics: 1) participants' background and their everyday routines; 2) summaries of self-tracking practices; 3) experiences and feelings in relation to self-tracking practices and data practices; 4) sharing practices; 5) worries and concerns about these aspects; and 6) changes and benefits of their practices. Each repeat interview guide was different and adapted to suit each participant.

At the beginning of the interviews, I offered opportunities for participants to ask any questions, briefly explained the research aims and ways of using research data in this project, and reminded participants that the conversations were to be audio recorded and their private information would be anonymised. Interviews lasted an average of 1 hour and sometimes continued for almost 2 hours. I noticed that many participants started to lose concentration and patience after over 1 hour of conversation and gave shorter responses. Due to ethical concerns, I did not force participants to continue interviews if they felt they had lost interest or were tired. When I noticed a participant was tired, I always wrapped up and noted unfinished topics for repeat interviews. This was one of the advantages of repeat interviews: the participants showed stronger interest and naturally engaged with conversations in a more patient manner in follow-up interviews.

Ten repeat interviews were carried out after analysing initial interview data. The decision about repeat interviews was based on participants' agreement and my own assessments. As ten participants agreed, they provided me with screenshots of self-tracking data that were produced using the devices/apps approximately one month after the first interviews.

After organising and analysing the materials that participants shared prior to repeat interviews, I sent each of the ten participants all their materials to demonstrate their self-tracking data and invited each of them to talk through them with me. For example, I asked them to give detailed descriptions on why and how they recorded certain data, how the recorded data were meaningful or valuable to them, and why they shared certain data online. This aimed to prompt reflection and link to particular time periods and self-tracking activities (Weiner and Will, 2018). Repeat interviews lasted up to 2 hours, with the average length being around 90 minutes.

For self-trackers, their devices, apps and data are mundane materials and part of their everyday lives. Some interview participants barely checked their data until they started to talk about them during the initial interview and before the repeat interview. Some types of data were seen as meaningless to the participants, so they rarely paid attention to them. However, when they explained why they barely looked at the data, they also talked about their emotions and experiences behind the data. This suggested that material methods can trigger new memories, produce embodied and emotional descriptions (Holmes, 2020), and encourage the emergence of new narratives. Often interview participants found it easy to describe their feelings about the data when they looked at their screenshots.

During interviews, one of the challenges for some participants was to verbally express their feelings. For example, I asked questions like "how did you feel about seeing the data?", or "what was your feeling when you realised your watch had no battery?", and "can you describe your feeling when you received 'likes' and 'comments?" Some participants had difficulties describing their emotions. For example, when Zeyu (20, male, undergraduate student, experience of treatment in hospital, initial interview) said the word "happy." I asked, "why did you feel happy?", and he replied with, "I feel happy." A few participants struggled to verbally express their feelings and emotions, especially when they talked about data. Some participants started to describe attitudes instead of feelings. For example, when I asked how Jiankun (37, male, energy company employee, cancer, initial interview) felt about missing recording data, he replied, "I decided to forgive this device. It had this bug that recorded incomplete data. Soon I tried to find a solution by searching this on the Internet. Then, I changed to use the other app instead." Some participants tried to explain experiences instead. For example, Zoe (27, female, Internet employee, history of depression, initial interview) responded "I feel it is more meaningful to concern myself than others."

The other challenge was that participants struggled to remember previous self-tracking experiences if they had not happened recently. For example, I asked participants to give examples of their most recent experiences of producing inaccurate data and what the data looked like, but for some participants, these issues occurred long ago. They vaguely remembered the scenarios but nothing about the data. I tried to remind them of relevant examples by providing similar stories from myself and other self-trackers. If I noted that participants could not remember or struggled to describe certain things, in the repeat interviews I asked the same questions again with their screenshots in front of us. There were feelings that were communicated nonverbally so I made notes of their gestures, facial expressions, tones, and pauses as evidence of emotional expressions by participants, although it was hard to record this information with audio interviews.

Most interviews in this study were conducted virtually through WeChat. Due to the ongoing pandemic, the University of Sheffield research ethics committee (UREC) updated its guidance to say that data collection should be conducted online only. Online interviews were convenient for me and the participants as we did not have to travel, and the scheduled times were flexible. A few participants were interviewed during their lunch breaks at work. Although some participants were late to meet the scheduled interview time, interviews were still conducted as planned on the day. If this situation had happened with offline interviews, they might have had to be rescheduled or cancelled. Online interviews also reduced potential harms and safety issues for both sides. Especially with the lockdown restrictions, online interviews made the research fieldwork feasible, and participants and researchers were less at risk of catching COVID-19. Video online interviews opened up the home environment where they usually tracked mundane activities, while it might have been difficult to be invited into their homes for offline interviews. For example, Xiao explained the reason he could not use Switch to track his fitness was because his room was too small to do this kind of self-tracking activity, and he showed me his bedroom to demonstrate this. All participants were free to choose either video or audio interviews – only nine participants conducted video interviews.

Reasons for preferring audio interviews included not being dressed properly at home, unstable Internet connections, and potential distractions to their partners' working nearby.

Despite these benefits, possible issues were involved in online interviews such as the potential for "subtle virtual and non-verbal cues" (O'Connor and Madge, 2017) to be lost. The biggest challenge was that it was hard to engage with the apps that participants used. They all used mobile phones for online interviews, and it was impossible for them to show me how they used their self-tracking apps while chatting online. Although it was possible to briefly show wearable devices on camera, their data were mostly stored in the bespoke apps which were impossible to see. Occasionally, online interviews were also interrupted by participants' relatives. For example, when Xiao Yang paused and tried to come up with her own response, I could hear that her boyfriend sharing a few words to help her find answers quickly. Yang lived with her parents, and she was self-conscious at some points when she talked about her personal situation. These issues could be avoided in offline interviews. Additionally, some technical issues negatively affected online interviews. Sometimes, participants' voices were briefly lost online, and I had to restart the video or audio calls. Background noises in online interviews can be recorded and influence transcripts, such as noises coming from Ben's and Cathy's companies.

3.4.4 Thematic analysis

Thematic analysis is widely used in qualitative research to analyse interview data and includes four phases: transcription, data management, coding, and identifying themes. It helps researchers to identify, analyse, and interpret themes within interview data (Braun and Clarke, 2006; Evans and Lewis, 2018). According to Braun and Clarke (2006), thematic analysis is a flexible and useful method that helps identify "rich and detailed, yet complex" (p.78) meanings found in data. This research took a comprehensive inductive and deductive analysis approach for thematic analysis. Inductive analysis means that themes are identified based on data themselves (Patton, 1990). Deductive analysis is a detailed method of coding and analysis, based on the existing literature related to the research theme (Azungah, 2018) or the research questions for the particular study (Braun and Clarke, 2006).

The first stage of thematic analysis started in getting familiar with the interview data by manually transcribing all the interviews verbatim. Screenshots of self-tracking data (ordered by number), interview notes, facial and voice expressions of participants (if captured) were all woven into the transcripts at this stage. Transcripts of the pilot study and two face-to-face interviews were translated into English to get feedback from supervisors before conducting new interviews. Transcription is a key step in preparation for data analysis. I used NVivo, a software program for data coding and data management, to create a coding frame. Some explicit themes emerged from the data by reading transcripts of what people said about their self-tracking data. While doing this, I wrote a summary of each participant, including content from one or two rounds of interviews, materials that they sent to me, and my reflections on the participants during and after interviews. In the summary I also highlighted the key themes

that emerged in each participant's story. This process helped me to gradually create a demographic table of interview participants (see Table 3.2) and a table with an overview of technologies and their features that participants used (see Table 4.2, Table 4.3, and Table 4.4). This initial coding frame and the tables provided a clear portrait of each participant and an overall picture of the whole dataset, which was of benefit when writing up empirical chapters.

Then, based on initial codes at the first stage, I went back to transcripts on NVivo and deductively identified underlying meanings in the data. This relied on my personal assumptions, research interest, and analytic thinking. For example, I identified the theme 'feeling differently in different practices', which I was unaware of at the initial stage of the coding process. In this process, I aimed for a detailed critical analysis of meanings of data to answer the research questions if possible. I categorised notes, descriptions and relevant literature under each theme and subtheme on NVivo. Afterwards, I reorganised each theme to make them fit together, which eventually became the themes of each empirical chapter. Certain topics only appeared in some participants' narrative stories, although they were important for the study. For example, only a few participants expressed that they had experiences of sharing their self-tracking data publicly, which was different from the other participants who reported rare engagements with sharing self-tracking data in public on social media. This raised an interesting theme: Chinese self-trackers' resistance to publicly share and communicate in self-tracking practices (see Chapter Seven).

3.5 Semantic Network Analysis

Digital methods have become a distinct strategy for Internet-related research and can make online social lives available for analysis (Marres, 2017). Online data are used to understand social trends and phenomena in a digital context (Rogers, 2017). Semantic network analysis of social media content was used to seek answers to RQ3 – how Chinese self-trackers share and communicate about their self-tracking practices and what they share and communicate – to gain a broad picture of sharing about self-tracking. This study sought to consider posts from a wider group of people to see how they talked about self-tracking than just the small group of people who participated in interviews.

The third research question aims to explore what and how people share about self-tracking. As seen in the literature review, scholars have explored this topic by looking at sharing practices on social media publicly and privately as well as sharing with people offline. Only nine interview participants talked about their sharing experiences online and offline, while the other interview participants either never shared in relation to self-tracking or had stopped sharing. I therefore wanted to discover what Chinese self-trackers shared about self-tracking and how they represented themselves on Sina Weibo. Semantic network analysis was used to this end.

Although there are many popular digital platforms in China (including Zhihu, Douban, Red, and WeChat), I chose Sina Weibo because it is one of the most influential social media platforms and is an ideal open platform from which to collect data. For example, although WeChat is a super app where Chinese people share their step data, health information, and daily lives through the Moments feature (Hjorth et al., 2020; Zhang and Jung, 2019), public posts have restricted access (Zhang et al., 2018). Like Twitter, Sina Weibo allows users to post short messages, repost others' posts, send private messages to friends or strangers, comment, share, and 'like' posts, discuss with others via specific tags as well as interact with other services. The content of posts can include text, emojis, images, videos (including live videos), music, stickers, animations (including animated gifs), and external URLs, which can provide a lot of rich data for social media study. Also, Weibo is a public platform where users' information (profiles, posts, and comments) can be visible to audiences if users set the privacy of posts to 'public', the default setting. Therefore, a variety public content is shared about health and fitness-related information generated by self-tracking technologies. In short, Sina Weibo is an appropriate field for data collection in this study.

3.5.1 Semantic network analysis

Semantic network analysis (SNA) in social science is a useful method for identifying themes and meanings in text data such as social media content (Segev, 2021). This method was selected for analysing many Weibo posts to understand Weibo users' self-tracking experiences and to interpret their data. A wide range of studies based on social media have applied this method on various topics such as vaccine communications on Twitter (Kang et al., 2017), public perceptions of the COVID-19 pandemic (Yang and Vicari, 2021) and its vaccine on Twitter and Weibo (Luo et al., 2021), public discourse around privacy on Weibo (Yuan et al., 2013), and Chinese social relationships (*guanxi*) on Twitter (Yan and Yasseri, 2017). However, at the time of writing, I was unaware of any researchers who have studied digital self-tracking on social media through SNA. The interview method is often more popular for studying this topic (Kent, 2020). Studies using this method have investigated representations of the healthy self on social media (Kent, 2018; 2020), self-tracking communication (Lomborg and Frandsen, 2016), and self-tracking and social media for self-care (Paton et al., 2012). Not only is this aspect of my research a creative methodological contribution, the use of SNA is also desirable for answering the third research question about what self-trackers share and communicate about self-tracking practices.

This method is suitable for making sense of a large amount of data. The manual qualitative thematic analysis approach has limitations in the context of big quantities of text. It is time consuming to manually analyse a large sample of collected posts to identify patterns, and analysing only a small number of posts can introduce bias. Thus, SNA is more efficient than manual text analysis. Scholars use SNA to extract the relevant meanings of text data to achieve their research aims (Drieger, 2013; Segev, 2021; Yang and Vicari, 2021). For example, combined words in a sentence can express people's meanings and reflect their thoughts. Linked words in text produce social and cultural meanings that can relate to self-

trackers' experiences and ideologies in everyday life. Segev (2021) explains that "meaning is contextual; meaning is networks" (p.4).

Semantic network analysis identifies networked structures that are represented by nodes (words within in the semantic network, or people within social relationship networks), and the links (word semantic relationships, or social relationships) that connect nodes within the network (Drieger, 2013). Through the measurements and visualisations of these semantic relationships, interactions between words can be highlighted, allowing an identification of the shared meanings between linked words.

There are several key terms that I use in this project to help with understanding and identifying themes within semantic networks, including centrality, clusters, and modularity. Centrality is used to identify words that are frequently written in Weibo posts. Central words convey main meanings in a text and contribute to identifying the core themes within it. The term modularity is used to measure how densely central words are connected to each other within clusters and within the overall network. I explain these key terms in more detail in section 3.5.5 on network measurement.

3.5.2 Data collection using a web crawler

The first step in social media data collection was to identify appropriate search queries to produce manageable quantities of relevant social media data. I conducted an experiment with four approaches to identify search keywords for four months from early July 2020, based on my observations on Weibo and what interview participants said about their self-tracking experiences. After this experimental process, I decided to use three approaches to identify search queries: 1) names of self-tracking devices and apps that participants used; 2) a hashtag-based approach; and 3) a combination of popular hashtags and terms such as self-tracking technologies' names or types of self-tracking activities (such as sleep, mood, menstruation cycle, and weight loss).

A hashtag-based approach is popular in social media studies to find relevant research data on social media platforms (Vicari, 2017), as it is an easy and convenient way to collect data. However, it does not mean it is always the best way to conduct research. Omena and others (2020) argue that most people on social media communicate with relatively small audiences. I observed that not every self-tracker used hashtags in their Weibo posts and not every self-tracker used the popular hashtags related to self-tracking. Many created their own hashtags that only applied to their own posts to record their self-tracking experiences. It was difficult to come up with common search queries that self-trackers used to talk about digital self-tracking, but eventually the three approaches helped produce relevant data for this project. While coding interview data, I summarised seven main types of self-tracking activities that interview participants engaged with, which were used to explore what other self-trackers shared about themselves on Weibo. With three experimental approaches, I identified 29 search queries (see Table 3.3) for the data collection.

Types of self-tracking activities	Search keywords	Total (no. of posts)
Sleep	1. #snailsleep# (#蜗牛睡眠#); 2. #autosleep# (#autosleep#); 3. Data software #sleep# (数据 软件 #睡眠#); 4. Data record #sleep# (数据 打卡 #睡眠#); 5. #sleeprecord# (#睡眠打卡#)	427
Mood	#mooda#	93
Menstruation cycle	1. He App #aunt# (他 App #大姨妈#); 2. software #period# (软件 #月经#); 3. Software #menstruationcycle# (软件 #经期#); 4. Pregnancy #meetyou# (孕 #美柚#); 5. Software data #aunt# (软件 数据 #大姨妈#); 6. Software #aunt# (软件 #大姨妈#); 7. clue #aunt# (clue #大姨妈#)	1,364
Weight loss	#weightlossrecord# (#减肥打卡#)	984
Heart rate	1. #heartrate# (#心率#); 2. #heartratechart# #applewatch# (#心电图# #applewatch#); 3. #ECG# (#ECG#); 4. #restingheartrate# (#静息心率#); 5. #monitorheartratexiaomiwristband# (#小米手环测心率#); 6. #heartraterunning# (#心率跑#); 7. Heart rate #data# (心率 #数据#)	436
Exercises	1. Closing rings #applewatch# (闭环 #applewatch#); 2. Data #run# (数据 #跑步#); 3. Data swim #exercise# (数据 游泳 #运动#); 4. Data cycling #exercise# (数据 骑行 #运动#); 5. #workoutistopersist# #run# (#运动就是坚持# #跑步#)	2,162
WeRun	1. #WeRun# (#微信运动#); 2. Data #WeRun# (数据 #微信运动#); 3. #the topusersdeleteeachotheronWeRun# (#微信运动前几名的互删一下#)	1,305

Table 3.3: Search queries and relevant posts published from 1 January 2019 to 27th October 2020

Next, I used the 'Advanced Search' feature of Weibo, which enabled me to find relevant posts by searching keywords. I selected the period between 00:00 on 1st January 2019 to 00:00 on 27th October 2020 as the timeframe to search for posts to produce manageable numbers of relevant posts in relation to my research aims. I extended the sampling period before December 2019 because I aimed to avoid content that might be affected by the COVID-19 pandemic in 2020. As my participants in repeat interviews mentioned that their self-tracking experiences differed compared to in the past, I decided to look at what other people shared during the pandemic. This timeframe was applied to all keyword searches. I manually searched for the above identified search queries one after the other.

I asked a British professional developer to create a web crawler using the computer programming language JavaScript to automatically collect posts I found through the 'Advanced Search' on Weibo. As this research question aimed to explore what people shared

about self-tracking on Weibo, it needed not only written posts but also other relevant information such as comments, selfies and images. All this shared content provided a good context to understand self-trackers' experiences and perspectives. It was time consuming to manually collect all these elements for each post. Therefore, a web crawler was needed to extract information from the 'http' database in an efficient manner. Thus, I manually searched posts by searching for each query using the 'Advanced Search' function that provided a number of pages of posts, and then I used a web crawler to automatically gather all these posts including relevant elements of each post that this study needed.

To ensure the accuracy of automatic data collection, several tests with the web crawler programme were conducted before the actual data collection. Large quantities of data were automatically collected by the web crawler program; however, it gathered not only relevant data but some that was "tangential and off-topic" (Stewart and Quan-Haase, 2017, p.391). For example, a test began with several posts on the first webpage of search results on Weibo, by searching the keyword 'snail sleep' (the name of a self-tracking app). I compared the original posts on the first webpage with the collected posts in the temporary dataset to see if there were any errors such as missing relevant posts and emerging irrelevant posts. Then, the test searched a larger number of posts with the keyword 'snail sleep'. Tests stopped when the test results satisfied the task of accurate data collection, and the collected posts reflected the web content. The web crawler programme was finally implemented to collect the posts published within the selected time frame. I used the web crawler to implement the following functions: crawling Weibo users' basic information (including username, ID, account address) and the basic information of each post (including search queries, original post content, comment content, images under each post, publishing time, and page address). The captured data were stored as structured data in CSV (comma-separated value) format.

3.5.3 Preparation for constructing semantic network

Researchers (Drieger, 2013; Luo et al., 2021; Segev, 2021) agree that there are three key steps for conducting SNA: word selection, semantic network visualisation, and interpretation of meaning of text-based network. This section focuses on the first step: selecting meaningful words for network construction. I collected 5,583 relevant social media posts to explore what people share about self-tracking publicly on Sina Weibo. To identify which words in the dataset should be included in the analysis, I began by preparing to create a semantic network, including creating a custom dictionary, segmentizing words, and listing co-occurrence words.

I used the Jieba Python package for word segmentation to segment each word in each sentence in each post. The Chinese language is different from other languages. Each English word is separated by a space, while each Chinese word is connected and not separated, for example "I sleep well" in Chinese is 我睡得很好. This process of word segmentation is known as tokenization (Drieger, 2013). I started with a test of word segmentation by reading original posts and manually creating a custom dictionary to add custom words that the dictionary in the Jieba package did not include.

I created a list of segmentized words and co-occurrence words. According to Danowski's suggested approach (Danowski, 1993), the word pairs should be constructed based on a distance of three words between each sentence to optimally identify semantic clusters. To achieve this, I excluded stop words, stemming and other irrelevant words. I identified meaningful words including nouns, adjectives, emojis and the textual version of emojis such as '[smile]', and noun phrases. Stop words are semantically meaningless words and irrelevant words such as 'I' and 'me' (我), 'all' (都), and 'also' (还), which are frequently connected with almost all other words but have no actual meanings for this research. I also excluded stemming words and other irrelevant characters. Stemming words means chopping the end off words such as 'playing' (在玩), 'plays' (玩), and 'played' (玩过). Other irrelevant textual components include punctuation marks, symbols, non-Chinese words, and URLs. However, I kept English characters such as 'Day 1' and 'Check-in 3' as text data, as they were important for identifying themes about what to share about self-tracking on Weibo. Using the Jieba package, stop words and irrelevant words were removed from the dictionary, and 24,357 words were retrieved from the text data. As a result, I identified 309,550 co-occurrence words in total – a co-occurrence word means that one word connects to another. These single words and co-occurrence words were structured as a matrix of word pairs and visualised by Gephi to be analysed. I saved the file as a CSV file.

Previous studies (e.g. Calabrese et al., 2019; Mizoroki and Kim, 2021) have shown that a small sample size can make the network readable and clear, and still indicate accurate meanings in the main themes and the topics within the themes. I sampled the top 185 solitary words based on each word's frequency – how often each word appeared in 5,583 posts – as each of these words appeared in total posts a minimum of 100 times. I also excluded search queries, as they were central words and most frequently mentioned in each post. If I were to include search queries, they would blur themes within the network. The strategy of excluding these words allowed me to see a relatively loose network and let potential themes stand out within the network. After these steps, I identified 105 solitary words with frequencies above 100 and 3,522 co-occurrence words for network construction.

I converted the words into three files. One was a summary file that included the list of solitary words, the frequency of each solitary word, all linked words of each solitary word, and all post IDs of the posts that included each solitary word. This file was only used as a reference when I needed to check the original posts rather than for analysis. The other two files were used for data analysis: one was a node file that included the list of the 105 solitary, and the other file was an edge file (see below) that included the list of 3,522 words, the linked words of each word, and the number of times the two words linked to each other.

3.5.4 Semantic network visualisation and network measurements

Gephi has a built-in community detection algorithm that can extract a set of densely connected words that belong to different semantic communities (Blondel et al., 2008). A word-based network (see Figure 7.1 in Chapter Seven) was created and visualised in Gephi

using ForceAtlas2 layout to retrieve words and clusters and render the network clear and readable. ForceAtlas2 is a force directed layout built in Gephi to spatialise an overall network (Jacomy et al., 2014). I used this layout because it is the most widely used and can provide clear visualisations – I then used Appearance to adjust the sizes of nodes, labels, and edges to make them readable.

Three key elements of the network structure are nodes, links and clusters. Nodes represent words in this study and are linked by a range of undirected lines showing relationships between nodes (Kang et al., 2017). The thickness of each link shows how strongly two words link to each other. The other key element relates to links, also called edges, corresponding to the word relations. The semantic network structure contains a third key element, clusters, that contains groups of strongly interconnected central words that share a meaning.

I used three measurements of important words (also called central or influential words), including frequency, between centrality, and eigenvector centrality, as explained below. I also used a network analysis approach called modularity analysis to identify themes. Central words and co-occurrences can create meanings, which are seen as important words in the self-tracking discourse on Weibo and they help to highlight unique themes (Segev, 2021). I used three measurements to calculate important words (also called central words and influential words within the network).

Frequency analysis is one way to identify the importance of words. As mentioned in the last section, I selected the words with frequencies above 100 from the list of overall extracted words to measure which words people most frequently mentioned in their posts. Words that are frequently used by people and strongly linked with others are considered important or central words in networks.

The second measurement of the words in the network was betweenness centrality, which indicates the relationship between linked words within clusters in the network. I measured the size of nodes by betweenness centrality to see which words were located between two words in the network. Betweenness centrality measures a frequency of a word appearing on the shortest paths between words in the whole network. Words with high betweenness were indicated as central words, as these were connected to a greater number of other words within a cluster. The interconnected words produced a common meaning and often shared a topic within a cluster. The betweenness centrality metric helped to identify main topics and the key topics within clusters and had the benefit of identifying themes in the sharing discourse. Also, the central words with high betweenness were linked to many other words between clusters in the entire semantic network. This helped to interpret the overall narrative about sharing in relation to self-tracking.

The third method I used to calculate central words was eigenvector centrality. This calculation showed the influence of words in the network in terms of the location and importance of words in the overall network, based on automatic language algorithm analysis (Segev, 2021; Youn and Jung, 2021). Words with high eigenvector centrality indicate that they are linked to many central words with a high number of links in the network.

Then, I carried out a modularity calculation in Gephi to identify the key semantic topics within the network. Modularity analysis is a semantic community detection method (Blondel et al., 2008) that produces different semantic clusters of words that co-occur in the same sentence within the network. After detecting semantic communities with the 'modularity' measurement, I assigned nodes colours based on the partitioning parameters of Modularity Class, which is used to measure the strength of divisions in the whole semantic network. A modularity analysis was used to make sense of networks and to find and interpret themes of public sharing about digital self-tracking on Weibo, along with statistic indicators. An overall network is contained in clusters and shows the main themes and topics that these linked words convey. As shown in Figure 7.1 in Chapter Seven, each semantic cluster is distinguished by a different colour that represents a topic where each word and its edge are the same colour as its cluster. Each cluster can represent a theme.

I acknowledge that the modularity calculation built into Gephi is a black box and might not be entirely accurate. Results of semantic clusters were calculated by the community detection algorithm in Gephi slightly differently each time I ran it. Researchers argue that how Gephi undertakes different measurements of centrality of words is not entirely clear (Segev, 2021), and that it is necessary to continue improving community detection algorithms (Blondel et al., 2008). Therefore, I argue that there is still scope to investigate the analytical meaning and accuracy of the algorithms.

3.5.5 Combining SNA and thematic content analysis of social media data and thematic analysis of interview data

I conducted analysis of social media data in three steps. The first phase of data analysis was a quantitative semantic network analysis with measurements of words (as above). The second phase was qualitative thematic analysis of the network based on these measurements. The third phase was thematic content analysis of sampled original posts that were included in the network. Some interview data was combined with analysis of the posts to support arguments as required in Chapter Seven. Drieger (2013) suggests a mixed quantitative and qualitative analysis approach for SNA, as quantitative metrics support "the qualitative analysis and exploration of semantic structures" (p.4). I quantitatively analysed which words could be identified as central words in the network, how the words linked to each other, and what words could be identified together as clusters (see Table 7.1).

To achieve a qualitative thematic analysis of the network, I interpreted meanings of the central words and co-occurring word pairs in the clusters and identified themes from them (see Table 7.2). To do this, I relied on the original posts. This can provide the context for qualitative interpretations of the semantic network (Segev, 2021) and suggests how different semantic topics in clusters were connected to each other. This combination of quantitative and qualitative analysis approaches was helpful for identifying themes through cluster analysis. These identified themes were based on my interpretations from the literature review,

thoughts about original social media post data, and my understanding of my interview data about self-tracking and sharing.

Besides SNA, I manually conducted a thematic content analysis with a random sample of 300 original social media posts that were represented in the network. The aim was to analyse not only the underlying meanings of words but also to gain more detailed information in clusters. Analysing these posts, along with their associated visual content, complemented prior analysis of quantitative statistics and the network. The coding themes I employed mirrored the three themes (see Figure 7.1 and Table 7.2) that emerged from the SNA, ensuring a consistent and in-depth analysis of sharing data practices on social media.

I imported the post sample into NVivo, categorising each post into its corresponding theme. This involved coding central words, visual content (e.g., photos and emojis), and understanding the overarching meanings of each post. This process not only allowed me to establish a coding frame but also helped me identify patterns in how individuals shared their self-tracking data. For example, I observed that popular and distinctive hashtags were often used to document everyday lives and data. At the same time, interpretating visual content was crucial for understanding the context of the textual data. On occasions, while the visual and textual data seemed to convey contrasting information, they often resonated with narratives. An example is the implicit ways health identities were represented, as discussed in section 7.4. To interpret these nuances, I leaned on my prior knowledge, interview data, and analytical thinking to make sense of them. This analysis approach further unpacked the narratives underlying each theme, for instance, personal lived stories that were discussed in the posts as the construction of online self-identity. Some of these posts were chosen as representative examples to support the arguments in Chapter Seven. They offered rich insights on what and how Weibo users shared about their data and lives, which potentially could have been overlooked in the interview analysis and SNA.

A thematic analysis with interview data was applied to find themes about sharing, which helped provide additional evidence to support arguments I made in Chapter Seven. This approach offered detailed information on why people share (or not), where else they share, and how they share and communicate online and offline. These themes in relation to sharing practices cannot be identified from the clusters alone. Thus, the combination between SNA and thematic analysis of interview data was appropriate for data analysis in this study.

3.6 Ethical Considerations

The ethical concerns in this research relate to ensuring that participants engaged with the study without any danger of risk and harm to them, me, or others. This study involved participants' sensitive narratives, sexual experiences, illness histories, private personal data, and other types of ethically sensitive information. I made efforts to support each participant throughout each stage of the study. In the qualitative interview with object elicitation methods approach, participants were respectfully invited to take part in interviews. According

to the Sheffield Research Ethical Policy, I ensured that my research did not cause any physical or psychological harms or risks to my participants. All participants contributing to the study that were respected, protected and treated equally. They were made fully aware of the nature of the study, the research aims, my personal contact information and identity, storage, management and use of interview data before and after the PhD.

To ensure that participants were not at risk of exploitation in the study, I offered each participant a £10 voucher for each initial interview and an additional £10 for each repeat interview. Some participants said that it was unnecessary to offer vouchers as they were happy to help with the research. I offered vouchers to each participant and let them decide if they would accept or not, though all did accept. One participant gave a voucher back as he withdrew from the repeat interview; another two participants withdrew from repeat interviews, but I did not ask for vouchers back as I appreciated their contributions.

I fully communicated with participants and patiently answered all questions they had. During the interviews, I was aware that participants might have suffered from (at the time or previously) serious diseases. By asking questions about motivations for self-tracking and the relations between health conditions and self-tracking, I always reminded them that they did not have to respond to my questions if they felt uncomfortable talking about it. I was sensitive to whether they were currently unwell or dealing with significant issues in their lives.

Messages in relation to self-tracking in the chat box on WeChat that interview participants casually sent to me were included as research data after a review of their ethical approval. With participants' consent forms, messages were used as part of interview conversations and sometimes led to my follow-up questions. All research materials were locked in secure digital storage and will remain there until I have submitted my thesis and published journal papers in the future.

Additionally, I received a notification on my app that I had sent private messages to many social media users (27 users) in one day, and I should wait until the next day to be able to continue sending messages to strangers. This privacy setting protected potential participants from unnecessary disturbance. Some users set their privacy so that they could only receive private messages if I followed them. I followed potential participants to build trust before sending recruitment messages. Some users only set their posts to be visible to the public relatively recently. These privacy settings were new to me, so I was learning in the early stage of recruitment. The privacy settings and modes of privacy protection of potential participants, in turn, increased my ethical concerns. I tried to contact potential participants through social media platforms in a more appropriate, respectful way in the following recruitment process.

In terms of self-protection, I deleted a few messages sent by strangers on Douban. Two tried to cheat me and asked for money, and four invited me on a date. Although these experiences shocked me at the beginning of recruitment, I came up with solutions to protect myself. To reduce online harm to myself, I increased my ability to recognise harmful information from

random social media users and ensured I would avoid being hurt. I also reported harmful information to the social media system to stop being harassed by the same users.

Before social media text mining, by looking at the privacy policy of Sina Weibo and previous research papers, I was aware that Weibo restricted access frequencies for IPs. There were five levels of authorisation, and the general authorisation regulated that the maximum number of times a single IP could gain access was 1,000 times per hour (Xu et al., 2015). Developers sometimes design their applications against visit restrictions to avoid access rejections. However, to respect and protect potential participants who published posts on Weibo, I asked the developer to follow the regulations of the platform. The web crawler program only accessed the platform when it was available to use. The web crawler program was written on the developer's laptop, but he signed a form to agree that all data would be deleted from his laptop once data collection was complete and would not be shared with third parties for any reason.

The web crawler program was designed to only collect relevant information to meet the research aims and to avoid redundant information that could cause ethical issues. To answer the research questions, the necessary data included posts, emojis, comments, and photos, but other information in posts was all stored in my dataset but excluded for data analysis, such as published dates, and usernames. This kind of information was only used by me to accurately find original posts if needed. I pseudonymised social media usernames that were used as research data and paraphrased their posts in English rather than inserting screenshots of their original posts. I aimed to reduce the possibility that any reader could track users' identities and their posts. I paraphrased the posts and blurred all information that could be considered risky or harmful in terms of leaking privacy and identities of potential participants and other people in their networks.

3.7 Conclusion

In summary, this chapter has restated the four research questions, outlined the methodological approach, and discussed ethical decisions and relevant solutions for the ethical issues faced during the entire research process. It has laid out the research design and explained how the project aims were achieved. It discussed the mixed methods used in the research process, including in-depth semi-structured interviews with object elicitation methods and the semantic network analysis method. Research data were analysed by thematic analysis of interview transcripts, semantic network analysis and thematic content analysis of social media data. The data revealed themes relating to how self-trackers make sense of their devices and apps and personal data in everyday life in China. The following four empirical chapters offer a detailed analytic discussion of the findings that were generated through analysis of interview data, screenshots of self-tracking data, and social media data.

Chapter 4 An Overview of Diverse Digital Self-Tracking Technologies and Tracking Motivations

4.1 Introduction

This chapter is the first of four empirical chapters but a more descriptive chapter than other three empirical chapters. It describes three aspects of tracking: what participants track, how they track in terms of what self-tracking devices, apps and features they use, and why they track. By briefly introducing these aspects, this section provides context in relation to what self-tracking technologies are used by participants in China. This fills a knowledge gap, relating to the range of devices and apps that Chinese people use in everyday life which are absent in the literature and differ with studies conducted in the West.

Self-trackers wear different devices and download different mobile applications that come with a range of features to monitor various types of things in everyday life. As shown in Tables 4.2 and 4.3, the 21 interview participants used 48 different devices and apps, and three participants used pen and notebook to track. Within those 48 devices and apps there were 20 main types of features (as shown in Table 4.4) that participants used in their self-tracking practices. Using these technologies and features, participants tracked 14 types of activities (as shown in Table 4.1) and used them for other daily uses unrelated to self-tracking practices. A brief description of these differences can help to answer the first research question about what differences matter in Chinese self-trackers' tracking activities.

This chapter will first summarise the different parameters interview participants tracked, and next move to a description of various types of digital self-tracking technologies they used, before introducing the main features that people used in this study. Finally, this chapter briefly discusses motivations for self-tracking, with more detail found in Chapter Five.

4.2 What to Track: Types of Parameters Participants Tracked

This section focuses on what participants tracked through an overview of the devices and apps they used. There were 14 main types of activities that participants monitored through digital self-tracking technologies and traditional self-tracking tools, such as pen and notebook. As seen in Table 4.1, the most popular type of self-tracking parameter tracked among interview participants was physical activity such as swimming, walking, running, weightlifting, cycling, and fitness training. The second most popular self-tracking parameter involved weight. Besides monitoring weight, four participants were interested in tracking body fat and its related parameters. Heart rate was the third most common activity, including sport, resting, and real-time heart rates. Other popular activities, monitored by seven participants, included sleep, menstruation cycle and relevant metrics, calories and food consumption. Other types of metrics that were less popular but important for some participants were bodily parameters (such as skin, toughness, blood oxygen), water, sexual

life and others. The overview of activities that participants tracked shows that people track a variety of aspects of everyday life (see Table 4.1).

Categories of parameters	Number of interview participants who engaged with activities
Physical activities	19
Weight	14
Heart rate	9
Sleep	8
Menstruation cycle (including pregnancy prevention)	8 (out of 11 female participants)
Calories	7
Food consumption	6
Bodily parameters (skin, toughness, blood oxygen, body temperature etc.)	5
Body fat	4
Daily expenses	2
Water	1
Sexual life	1
Mood	1
Work productivity	1

Table 4.1: Overview of parameter types that interview participants tracked

The other important finding here is that people sometimes track more than one parameter at once, as various tracking variables are correlated to each other in digital self-tracking practices. Monitoring heart rate is an important parameter in tracking physical exercises, and sleep. Some participants knew that bpm (beats per minute) can help them adjust exercises constantly. For example, Xinyue explained how he checked his heart rate and running data simultaneously:

> The JoyRun app enables me to monitor running time length, speeds, and heart rate. Fast heart rate easily causes death, while low heart rate means the intensity of running is not high enough. I usually keep my heart rate around 140 bpm. My Apply Watch usually shows real-time heart rate which is intuitive. It also allows me to review monthly data history about average heart rate, maximum and minimum heart rate, and overall running distances. (Xinyue, 40, male, IT engineer, initial interview)

This example illustrates the importance of tracking heart rate for monitoring physical exercises such as running together. The heart rate metric allows people to adjust the speeds of exercises and protect their body from overwork. This finding resonates with the study of tracking heart rate (Pantzar and Ruckenstein, 2015), suggesting that there is a relation between a certain exercise period and fastest heart beat. Tracking heart rate with exercises produces a new meaning for heart rate data: it becomes a signal telling people about ways of

controlling their bodily movements and capabilities. Similarly, heart rate can be tracked alongside sleep to develop a self-awareness of real-time bodily conditions during sleep, allowing people to learn whether their bodies are potentially in danger. Three participants monitored their heart rate during the sleep to learn their bodily conditions when they were unable to consciously feel their bodies. For instance, Lele paid close attention to his heart rate data and sleep data:

> I wear my Apple Watch in my sleep. I set Do Not Disturb mode at 11:20pm. In this case, the mobile phone stops sending notifications and distracting you to fall asleep. When I wake up, I check my bedtime, low heart rate data, and percentages of deep and light sleep. In terms of heart rate, I remember sometimes the data show that my heart rate was below 40 for a few minutes. I didn't understand this, so I searched for relevant information online that there it can be life-threatening under 40. I was quite scared. (Lele, 26, male, postgraduate student, initial interview)

Both examples suggest that tracking heart rate metrics provides information about bodies when exercising and sleeping. As Pantzar and Ruckenstein (2015) suggest in their study of tracking heart rate within 24-hour period for understanding stress, the two interrelated parameters are helpful for "strengthening self-knowledge, self-awareness and related practices" (p.102).

Weight is also a common parameter that is used to track menstruation cycle, physical exercise, body fat, food consumption, or calories together. Sometimes these parameters are mixed together in self-tracking practices, depending on people's tracking needs such as weight loss or improvement of exercise skills. Participants like Yang, Xi and Wen believed that seeing weight data played an important role in tracking their menstruation cycle as they were aware of the phenomenon of gaining some weight during a period. For example, Wen tracked weight, menstruation cycle, calories and swimming, and she explained her understanding of the relation between periods and weight:

> It is normal for girls to gain 1-2kg weight around the time menstruation comes. Yes, so I always comfort myself that it must be for this reason. (Wen, 28, female, primary school teacher, repeat interview)

Tracking both weight and menstruation cycle together comes from the participants' own observation of their body changes and peer communication with other female friends about their common experiences regarding weight changes during periods. This interrelation is consistent with previous examinations of menstruation cycle that confirm weight varies across menstrual cycles (Hildebrandt et al., 2015; Kishali et al., 2006). Many participants suggested that weight and the other metrics mentioned above were considered together for weight management and healthy lifestyles. Additionally, moods, sexual life, and menstruation cycle are sometimes tracked at the same time, for instance Pang carefully recorded her abnormal moods in her period tracker app, Clue, to confirm whether being emotional was related to her depression or menstruation cycle. I discuss this example in more detail in Chapter Six.

Besides, tracking more than one parameter at once happens when people use more than one device and app. These parameters are randomly monitored together but this depends on individuals' tracking preferences. For example, Xi tracked water intake, body weight and exercises, while Zeyu monitored his steps, food consumption and blood pressure. In short, people measure various aspects of their bodies and lives through digital tracking technologies in China.

4.3 How to Track: Overview of Devices and Apps Participants Used

It is necessary to consider the types of technologies that the participants used for tracking these activities to demonstrate how people track through the devices and apps. I categorise such technologies into two types: comprehensive self-tracking technologies and specialised self-tracking apps. By comprehensive self-tracking technologies I mean that each has multiple features to enable self-tracking multiple types of activities and sometimes even connecting with other mobile software applications. They are close to like (a version of) mobile phone but with in-built self-tracking functions. For example, an Apple Watch can track a range of things and connect to mobile applications (such as Facebook, Google Maps, News and Music) on the user's mobile phone. Additionally, Apple synchronises digital data across their bespoke watches, apps and wristbands. As such, comprehensive self-tracking technologies connect to social, economic and cultural aspects of mundane life. Three leading brands of comprehensive self-tracking technologies (see Table 4.2) used by my participants in China are Apple, Huawei, and Mi (also called Xiaomi, a Chinese technology company). These devices and apps also merge other digital services such as gym check-ins, mobile payments, phone calls, and other applications installed on mobile phones.

Specialised self-tracking apps (see Table 4.3) are designed for tracking a certain type of activities and are often developed by less popular technology companies than those named above. The apps are well-known for their specialised tracking functions, although some have developed additional features. For example, running trackers as a type of specialised app are used by serious runners or professional athletes for training (Pink and Fors, 2017a). Some running trackers also enable track weight and calories, but these metrics are not core functions. It is notable that there are some overlaps between devices and apps, because some specialised apps can connect with comprehensive watches and wristbands. For example, the specialised apps such as JoyRun and Mint Health (that is famous with tracking food consumption and calories) can be connected with Huawei Watch. This integration is similarly reflected on self-tracking studies in the west, for example, people can incorporate their data from Fitbit watches and wristbands to a sleep specialised app (Abtahi et al., 2020). In this study. I categorise them as two types to help me discuss how people engage with self-tracking technologies in a clearer way.

This section will describe types of devices and apps that interview participants used and the participants' responses to the everyday uses of such technologies, function, and features. The overview of technological types and functions will illustrate whether they are used as the

designers expected. Meanwhile, analysis of how participants responded to their design will illuminate to what extent these technologies fit people's everyday uses as well as cultural and social contexts in China.

4.3.1 Comprehensive and specialised self-tracking technologies

Table 4.2 shows a clear characteristic of comprehensive self-tracking technologies that three technology companies (Apple, Huawei and Mi) have created a collection of interoperable devices and apps. According to commercial promotional information for these brands' self-tracking products on their official websites, they all have common categories of tracking functions, including fitness, health, applications, alerts, and other functions (Apple.com, 2022a; Huawei.com, 2022; Mi.com, 2022). This section introduces how participants choose this type of technology for their tracking practices.

Table 4.2 shows that Apple Watches are comprehensive, including a wearable strap, and connect to at least ten Apple apps. The core Apple Health app is a comprehensive tracker that can monitor physical activities, periods, heart rate, sleep and more, while the other Apple apps are specialised tracking apps that each monitor one type of activity, such as fitness, blood oxygen, ECG, menstruation cycle, and sleep (Apple.com, 2022b). Most interview participants who used Apple tracking products tracked using Apple Watches, or the Apple Health or Fitness apps. Yet in one instance, Yang, who worked for Apple in China, occasionally used the Challenges app and other Apple specialised tracking apps. A few participants explained that Apple Watches were unaffordable so they used Apple's two popular apps for free instead. Five participants received Apple Watches as gifts from companies and friends, otherwise they reported that they would not buy them. Two participants replaced their Apple Watches with Huawei Watches when they bought new Huawei 5G mobile phones, as they were not compatible with Apple products. Descriptions of why and how participants chose Apple self-tracking technologies reflect that comprehensive versions of Apple devices and apps are people's first choices among other Apple apps, and that price is a key concern.

Brands	**Wristbands (price)**	**Smart watches (price)**	**Mobile applications (free)**	**Other tracking products (price)**
Apple	NA	Smart watches (£259-£1,739)	1) Apple Health (core bespoke app) 2) Fitness 3) Challenges 4) Cycle Tracking 5) ECG 6) Heart Rate 7) Sleep 8) All the Rings 9) Activity Tracker	NA

			10) Blood Oxygen	
Huawei	Wristbands (£25.04-£49.99)	Adult smart watches (£89.99-£449.99)	Huawei Health (core bespoke app)	Huawei smart scales (£11.86-£41.81)
Mi	Wristbands (£19.09-£44.31)	Mi watches (£41.91-£180.02)	1) Mi Fitness (core bespoke app) 2) Zepp Life 3) Mi Band 4) Mi Heart Rate	Mi Body Composition Scale (£11.87)

Table 4.2: Summary of self-tracking products of three leading brands that interview participants used

Similarly, most other participants used the comprehensive versions of Huawei and Mi self-tracking products that include smart watches and core comprehensive bespoke apps (see Table 4.2) to track a range of activities. Mi company has also developed multiple specialised apps (Mi.com, 2022b) that were never used by any of my participants except for the comprehensive Mi Fitness app. Two Chinese brands' self-tracking wearable products are relatively cheaper than Apple's (Huawei.com, 2022b; Mi.com, 2022c), and more participants used them than Apple Watches. Those who used Huawei and Mi mobile phones but did not buy other devices from these brands tracked daily walks and running activities using the core bespoke apps due to convenience and their multifunctionality. Thus, participants tended to use comprehensive version of devices and apps to engage with self-tracking as much as possible. Their choices were also related to the many options and various features of the comprehensive technologies, as discussed in detail in section 4.3.2.

Other specialised self-tracking apps are designed by lesser-known companies. The use of such specialised apps illustrates individual preferences of participants. Twenty-one participants used 35 specialised devices and apps (shown in Table 4.3). The three most used specialised devices and apps are WeRun (微信运动), Keep, and JoyRun (悦跑圈). These three were all fitness apps that were commonly used to track physical activities (running, cycling, hiking, workouts and walking). The other types of specialised apps fitted individual needs of participants, for example, each female interview participant used a different app to monitor their menstruation cycles and relevant symptoms.

Besides price and functional features of devices and apps, participants' preferences were related to individual tracking motivations, discussed below. Chapter Six about feelings suggests app design, in terms of features and data visualisation, triggers people's feelings about self-tracking, which implicitly affects their choices of devices and apps. For example, the interface of the Clue app shown in Figure 4.1 shows what it allows users to monitor menstruation cycle, ovulation day, fertile day, premenstrual syndrome, and symptoms for each day in a calendar. Participant Pang reported that she chose this app rather than other period trackers because of her satisfaction with its multiple features for tracking not only periods but also moods and other bodily symptoms, its clear visualisation, and the scientific information produced by the app. Similarly, Yiyi and Wen chose Period Helper and Meetyou

apps respectively because they enjoyed seeing the simple design of representing data. More discussion on feelings about data visualisations can be found in Chapter Six.

Types of specialised devices and apps	Specialised devices and apps	Number of participants who used specialised devices and apps	Number of participants who stopped using them permanently after initial interviews	Other specialised devices and apps, used in the past before initial interviews
Physical activities	WeRun	17	6	
	Keep	7	5	
	JoyRun	3	1	
	Yodo	2	1	
	Heart Rate band	2		
	Fitbit	1		
	Switch Ring Fit Adventure	1		
	Xingzhe	1		
	Huabei	1		
	PICOOC	1	1	
	Xplowa	1	1	
	Nike China	1	1	
	Adidas Runtastic	1	1	
	PB app			1
	Lexin Sport			1
Menstruation cycle/pregnancy/sexual life	Meetyou	1		
	Womanlog	1		
	Clue	1		
	Calendar on mobile phone	1		
	PinkBird	1		
	Period Helper	1		
Weight and/body fat	Lexin scale	1	1	
	Weight Loss Journey	1		
	Haoqing	1		
	Other smart Scale	4		
	Mint Health			3
Daily expenses	The Shark Pionner Expense	2	2	
Work productivity	Tomato	1	1	
Others	Evernote	1		
	Pen and notebook	3	2	
	Excel	1		
	Pingan Good Doctor Medical	1		

	Consultation platform			

Table 4.3: Summary of specialised devices and apps that interview participants had or currently used

Figure 4.1: Example of the interface of the Clue menstruation-tracking app

Additionally, the use of such technologies demonstrates both temporary and permanent uses, which can change with users' needs. For examples, Pang permanently stopped using the Tomato app to track her work productivity due to it being incompatible with her work pattern; Yingyue temporarily stopped tracking running via the Keep app, as she stopped running for a while. This finding accords with Didžiokaitė's (2018b) project about everyday tracking of calories whereby people track for a while when they need to for weight loss and then they temporarily stop tracking and continue their usual diet. My finding represents types of tracking contexts beyond tracking calories. It suggests that participants have their own preferences for choosing apps, and some are little well-known in the market and in the Chinese self-tracking literature. More discussion of associations between frequency, people's self-tracking needs, and their mundane lives is presented in Chapter Five.

Although comprehensive and specialised devices and apps are most participants' choices of recording the self and lives, the use of other tools such as paper and notebooks, mobile phones calendar, and Excel is combined with using digital technologies. For example, Tiyu used the Yodo app to track his running and steps; and he also aimed to lose weight so he weighed himself every morning, wrote it on a physical chart on the fridge. He only recorded his daily weight data when he had a proper goal for losing weight. Otherwise, he simply used the scale and had a sense of his weight changes without recording data. Similarly, Jiankun used Mi smart scale to monitor his weight but calculated changes in physical exercises by himself, as "it is more convenient by hand" (Jiankun, 37, male, energy company employee, cancer, initial interview). Mobile phone calendars can be used to track menstruation cycles, as "it is convenient and simple to use" (Tingting, 33, female, teacher at middle school, cervical pain, initial interview). Zeyu constantly monitored his blood pressure and sought information from doctors on the Pingan Good Doctor Medical Consultation platform. Thus, people combined digital self-tracking technologies with other tools to meet their tracking needs. This chimes with some studies of digital self-tracking (Lupton, 2021; Lupton and Smith, 2018; Throsby, 2016; Weiner et al., 2020), suggesting a combination of digital and traditional self-tracking tools.

This section provides an overview of types of self-tracking technologies that people use daily in China. Such technologies can be divided into two main categories: comprehensive and specialised devices and apps. They demonstrate a characteristic of integrability of self-tracking programs (Lyall and Robards, 2018) in that data is synchronised across different devices and apps within the ecosystem (Lupton, 2019), particularly the same brand's products. I argue that comprehensive versions of such technologies are people's preferred choices, although three leading brands have developed a range of bespoke specialist apps. Temporary and permanent uses of the technologies commonly occur in self-tracking practices, Their choices are related to the prices, convenience and functions of the technology, although individuals' lived experiences, lives, thoughts and feelings also play important roles (see discussion in other empirical chapters). These devices and apps are used together with other tools for self-tracking reasons. Drawing on these findings, it is notable that a range of devices and apps are used for tracking various types of activities. A further exploration of their functions and ways of using these algorithmic and functional features is discussed in the next section.

4.3.2 Overview of functions and features of devices and apps

Self-tracking features are mainly designed for self-tracking activities, although some features are used beyond self-tracking. I summarise seven types of functions of devices and apps that interview participants used in this section (see Table 4.4). Automatic and manual self-tracking functions are at the core of such technologies and they produce real-time data and manual data respectively. Automated tracking refers to the technologies that automatically capture data, such as recording 24-hour heart rate, including sleep periods at night. Manual tracking, on the other hand, involves people actively recording data through either digital

tools or traditional tools (e.g. pen and paper or spreadsheets) (Abtahi et al., 2020; Pantzar and Ruckenstein, 2015). All wearable watches and wristbands listed in Table 4.2 allow automatic tracking, while automatic functions are not available on every app and are unlikely to be applied for certain activities. Tracking often needs to rely on manual measurements. Only step tracking is always monitored automatically; other types of metrics (e.g. heart rate and weight) can be tracked by either of functions or both of them. Some other types of tracking need to rely on manual measurements such as menstruation cycle and moods. Participants used both types of function based on their own judgements and needs. This section will briefly describe how participants used the functions for their tracking activities.

Sometimes, weight data are manually recorded by self-trackers if their traditional scales are unable to connect to self-tracking apps. Smart scales can track bodyweight, body fat, and other parameters, but tracking these types of data are not necessary for all users. Some participants tracked bodyfat and other relevant parameters (see Figure 4.2) on smart scales when they needed to. For example, Cathy and Pang monitored their body fat for weight loss and good body shape. Many other participants used smart scales as a traditional scale as they were only interested in monitoring their weight. For example, Zeyu used the smart scale to measure his weight three times a day for health management: before breakfast, at lunchtime and before bed, and this manual monitoring was good enough for him to manage his weight. The use of both automated and manual tracking methods suggests that the participants actively engaged with weight-related data to support their individual needs. In contrast to the evaluation of both types of functions discussed by Abtahi (2020), people are likely to be more aware of and engaged with their data through manual tracking than automated tracking. I argue that personal preferences and needs of self-trackers empower them to pay attention to which functions they use to collect data and how to use them effectively.

Most participants automatically monitored calories when they were exercising or burning calories in their daily lives. Only one participant, Xiao, used to manually record calories and food consumption on the Mint Health app, but later permanently stopped tracking this. He refused to track food and calories, saying:

> The tracking food apps in markets provide mass templates and users' manual data. However, diet culture is extremally different, and types of ingredients are very different in different cities in China. Also, nutrition intake and calorie intake are influenced by cooking methods and spices. It is really challenging to accurately track and analyse this. If you want to have accurate data, unless there is a massive dataset to support and there is a kind of super powerful computer to calculate this. That might be possible. Current tracking modes for this is less convenient than calculation by my brain, so I never use this type of apps or functions. (Xiao, 37, male, marketing, sleep disorder and history of depression and benign tumour, initial interview)

Thus, the Mint Health app relies on Xiao's knowledge to calculate calorie and nutrition intake, and manually input the data into the system. He questioned this function as both metrics were related to cooking and spices. However, Zeyu had also studied tropology for a while and was preparing for examination as a Certified Chinese Health Manager. He also

learnt relevant knowledge about food intake and nutrition to live healthily, and self-tracked food intake including nutrition, calories and salt, but he found this function useful:

> It is really helpful to monitor calories. I am not quite sure how many calories each food includes, and I have to memorise them all, and I don't have a background in medicine after all. I learn to balance nutrition… If I don't use this function, I will not know that the daily maximum salt intake is not more than 6 grams and that water intake should not be over 2 litres, which are stipulated in China. If I overtake them every day, there will be a risk of having certain diseases. (Zeyu, 20, male, undergraduate student, experience of treatment in hospital, repeat interview)

Both examples suggest that manual tracking functions offer the same features, but people use them differently due to their personal tracking experiences and relevant knowledge. Other participants who automatically tracked calories mostly found this function useful for seeing how active they were and how likely they were to lose weight by combing it with weight data. Thus, food consumption replies on manual tracking, and calorie intake can be monitored either automatically or manually. As such, what and how people track relate to both functions of the technologies, but the functions never satisfy everyone as people have their own justification for the accuracy and practicality of the apps.

Like other types of tracking, a few participants (Wen and Yang) actively manually monitored their heart rates by placing their fingers on electrical heart sensors, while others (Xinyue, Guiyu and Lele) let the wearable devices automatically gauge their heart rate every second. Only one participant, Xiaoyang, monitored her heart rate by mixing manual and automatic methods and traditionally placing her finger over the vein in her wrist. Xiaoyang, who was concerned about abnormal heart beats and a history of family heart disease, paid close attention to her heart rate, always set herself up in a comfortable position and monitored her heart rate more than once each day. Digital and traditional ways of measuring heart rate were meaningful and helpful for her, and the choices for tracking means depended on her situation and needs in the moment. In contrast, Wen rarely manually monitored her heart rate and never paid attention to it. Sometimes Wen viewed her real-time heart rate when she was swimming. She was aware that a higher heart rate meant burning calories faster, so she aimed to get a clearer idea of her real-time data. The analysis so far has unpacked automated monitoring and a combination of both automated and manual tracking, for specific types of metrics.

Several metrics can only be measured by manual functions, including menstruation cycle, moods, water, photo-based food consumption, daily expenses, and work productivity in this study. Fertility trackers were used by some participants to only track the menstruation cycle and its relevant data through manual inputting of bodily symptoms (moods, body temperature, bleeding, and types of pain). Specialised trackers were used to track daily expenses (such as the Shark Pioneer Expense app) by manually inputting costs or scanning product barcodes, and to track work productivity (such as Tomato app) by manually setting time frames. Similarly, a few participants took photos of food and recorded the information into the apps such as the Mint Health app, but calories contained by food can be

automatically calculated. For example, Pang tracked her daily expenses on the Shark Pioneer app to manage her money better; she tried hard to scan barcodes of products to track each expense. However, she failed with tracking this several times:

> I track my rent fees, transportation costs, food expenses, fitness courses and so on. However, I often pay for things in advance like rent for one month, or dancing courses for three months. It is hard to calculate everything. The longest time of tracking my expenses was when I studies in the UK, but I haven't done this for a while. I might start again after I find a new job. (Pang, 28, female, assistant lawyer, history of depression and cervical polyp operation, repeat interview)

Pang's account of the inconvenience of manually tracking daily costs suggests manual monitoring requests extra efforts in the tracking practice and might lead to intermittent engagement with the apps. This finding resonates with the study of manual tracking (Khot et al., 2014), which found that people devote a significant amount of time and effort to manual tracking but may struggle to do so constantly. Discussion of automatically and manually self-tracking metrics demonstrates how self-trackers interact with devices and apps and how their functions are used differently by individuals. Certain types of metrics are limited to manual tracking, such as body temperature and menstruation cycle, while some types of metrics (like sleep and weight) are more flexible and can be tracked in both ways. I argue that the ability of functions and their corresponding features shapes what and how people track, but individual needs and judgement about functions also matter to ways in which they track.

The second main type of function is data analytics in terms of body analytics and algorithmic prediction. They enable users to analyse their lives and bodily conditions based on personalised data in the system, to calculate all the data that self-trackers produce and create reports to summarise the data, and to predict relevant metrics. Accuracy is a key concern for participants when they engage with their analytic data. For example, as smart scales can be connected to bespoke apps that synchronise weight data, a few participants (Yang, Pang and Cathy) paid attention to analytic reports about their weight changes and bodyfat; for instance, Yang sometimes looked at other relevant metrics on the Haoqing app, such as muscle and BMI (shown in Figure 4.2). All participants who were aware of or often viewed weight-related analyses through the smart functions of the scales and apps had doubts about their accuracy. They thought that the transparency of algorithmic data calculation was a 'black box'. Therefore, due to the inaccuracy of analytic data produced by smart scales, many participants distrusted the data and just used them as traditional scales. Some scholars (Crawford et al., 2015; Festic et al., 2021; Pantzar and Ruckenstein, 2017) have claimed that the accuracy and truthfulness of algorithmic self-tracking data and analysis are subject to evaluation, as people have to cope with issues of data inaccuracy and data incompletion and feel uncertain about how these technologies calculate and provide data. Chapter Six will explain further how these participants felt about analytic data and visualised data.

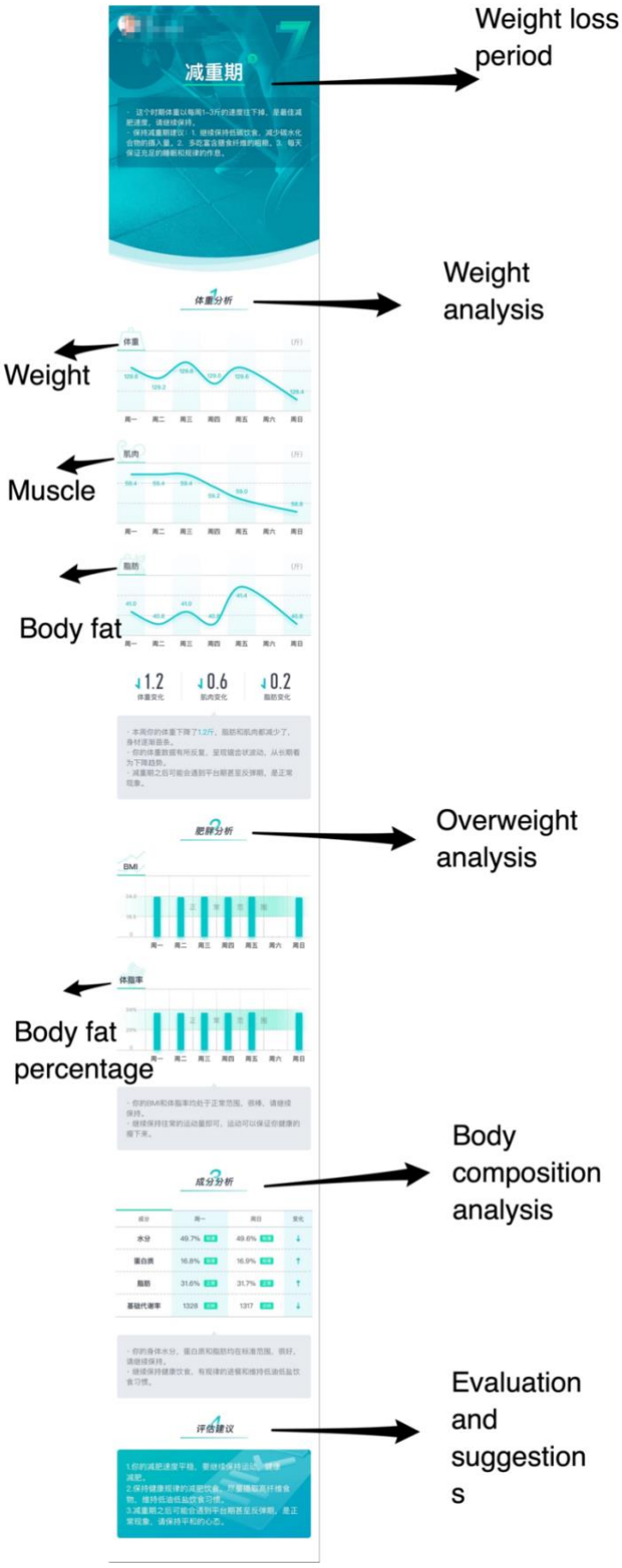


Figure 4.2: Screenshot of Haoqing bodyweight tracking app

Categories of functions	Features
Automatic and manual tracking	24-hour real-time monitoring (exercise, calories, sleep, heart rate, weight, stress, oxygen blood) Manual logging information (heart rate, menstruation cycle, food consumption, mood, body temperature, record weight, blood pressure, photos of meals)
Analytics	Data analytic calculation in relation to activities and bodily conditions (body fat, weight changes, menstruation cycle condition, sleep quality, skin) Daily, weekly, monthly, annual report Prediction (next menstruation cycle dates, pregnancy)
Recommendation	Training videos Shopping (running shoes and skin cream) News Popular science (health information) Friends
Gamification	Competition Challenge Rank Earning money Games
Notification for tracking	Real-time notification while exercising (speed, heart rate, distance, breath, stretch, fitness training) Reminder of starting activities (walk, stand, exercise)
Communication and socialisation	Connection with other digital technologies/platforms Social communities
Others	Waterproof Vibration sensor alarm Alerts (phone calls, receive messages, and find a phone) Mobile payment News

Table 4.4: Summary of main features of devices and apps that interview participants engaged with

By using Apple's wearable technologies as an example, its official website lists 11 types of fitness (such as yoga, cycling, walking and strength) (Apple.com, 2022a). Figure 4.3 shows fitness metrics that were gathered by participant Yang; calories were calculated based on the amount of exercise she did, and daily calories burned in general. Many participants find the accuracy of calorie data to be unreliable, and they treat it as a reference point rather than

objective data. To make better sense of the data, some self-trackers consciously compared the same type of data. Xinyue gave up on two apps and stayed with the JoyRun app by comparing his running-related data across the three apps:

> Three of them [Apple Watch, JoyRun and Keep] cannot satisfy my tracking needs so I use them at the same time. Sometimes two or three of them were used at the same, but in the end I realised that the Keep app can't provide complete running traces on its map and running data are quite inaccurate. (Xinyue, 40, male, IT engineer, initial interview)

Figure 4.3: Screenshot of Yang's data on the Apple Fitness app

Therefore, some self-trackers unintentionally had comparisons of steps produced by different apps and devices, and saw differences in their step data on different devices and apps. For example, Zeyu explained his comparison:

> Steps are different on WeRun, the Yodo Run app and the Huawei Health app. I compare my step data everyday whenever I review my step data. The information

> about my walks automatically shows on my mobile phone screen. (Zeyu, initial interview)

These examples suggest that analytic data are used as references for self-trackers to understand self-tracking outcomes but are often found to be untrustworthy. To deal with this issue, some participants rely on comparisons of data produced by different devices and apps. This was an issue several participants (Wen, Xinyue and Tingting) found annoying with self-tracking across multiple apps. As Tingting commented, "I have too many applications on my mobile phone. If one app enables me to track many things and deal with more than one thing, I definitely stick to one" (33, female, teacher at middle school, cervical pain, initial interview). The other way to make better sense of analytic data is to seek help from professionals such as training coaches or doctors. For example, Yang had her own personal coaches and tracked physical exercises and weight, meanwhile she took fitness courses at the gym. She showed her exercise-related data and weight to her coach to help her interpret the results of her weight lost:

> I love eating food, particularly dessert. Everyday my coach reminds me about eating less. My body fat is very high, like 31.5, which is beyond the standard of a normal woman. He also wears this type of wristband. We compare our heart rates and calories and then he gives me some advice. (Yang, 36, female, Internet employee, cervical pain and low heart rate, initial interview)

Prediction algorithms can remind users of upcoming menstruation cycle and fertility dates that were commonly used by most of female participants in this study. Menstruation cycle dates are important signs of pregnancy and reminders of the next period cycle, and baby due dates. Self-trackers record basic information such as dates of when their periods arrive and end, which can be easily forgotten. Menstruation sometimes comes irregularly, and the apps remind people of whether their period has come on time or not. To predict information relevant to pregnancy is very important for those who were worried about becoming or are eager to be pregnant. For example, Wen's ex-boyfriend disliked wearing condoms and she had several pregnancy scares before marriage. After she broke up with her boyfriend, she stopped tracking her ovulation days:

> My period comes on different days every month and I can never remember this. The Meetyou app tells me a rough start date, which is great. Also, I am worried about pregnancy [laughs]. So I pay close attention to when my safe period comes. (Wen, 28, female, primary school teacher, repeat interview)

Predicting menstruation cycle dates is used to make plans, for including leisure, business trips, holidays, examinations, and sexual lives. For example, Pang combined contraception pills and the Clue app to plan around her important law exams. Thus, analytic functions are helpful for participants to understand their bodies and activities in which they participate and aspects of everyday lives, although accuracy can be an issue for some of them.

Other functions were used less often by my participants than those discussed above but are worth briefly mentioning. The algorithmic recommendation function often recommends

training videos, products, news, health information and friends who also track using the same device or app. Several participants sometimes engaged with this function, for instance Xi checked recommended information about how to live healthily on the Fitbit app; and Jiankun accepted friend requests on the Nike app to track running together. Most participants avoided this function as most recommendations relate to commercial purposes such as selling skincare products on fertility apps, or running shoes or cycling equipment on fitness apps, or fake news for increasing high numbers of reviews on fertility apps and food trackers.

Gamified features (so-called gamification) are also built into some technologies. Lyall and Robards (2018) explain that gamification in self-tracking practices tries to make tracking fun, and it is often not treated seriously, creating playful engagement with gamified rewards. Many such apps offer badges, money, rankings, and certifications as rewards of participation in tracking activities. Xinyue participated in a daily running competition with his colleagues on WeChat. Yang engaged with a challenge called Close Three Rings on the Apple Fitness app and sometimes received rewards. Zeyu was interested in gaining money by walking a certain number of steps each day, and Lele aimed to win certifications and badge by tracking their running. Other participants sometimes joined in viewing step rankings on WeRun (as shown in Figure 4.4)

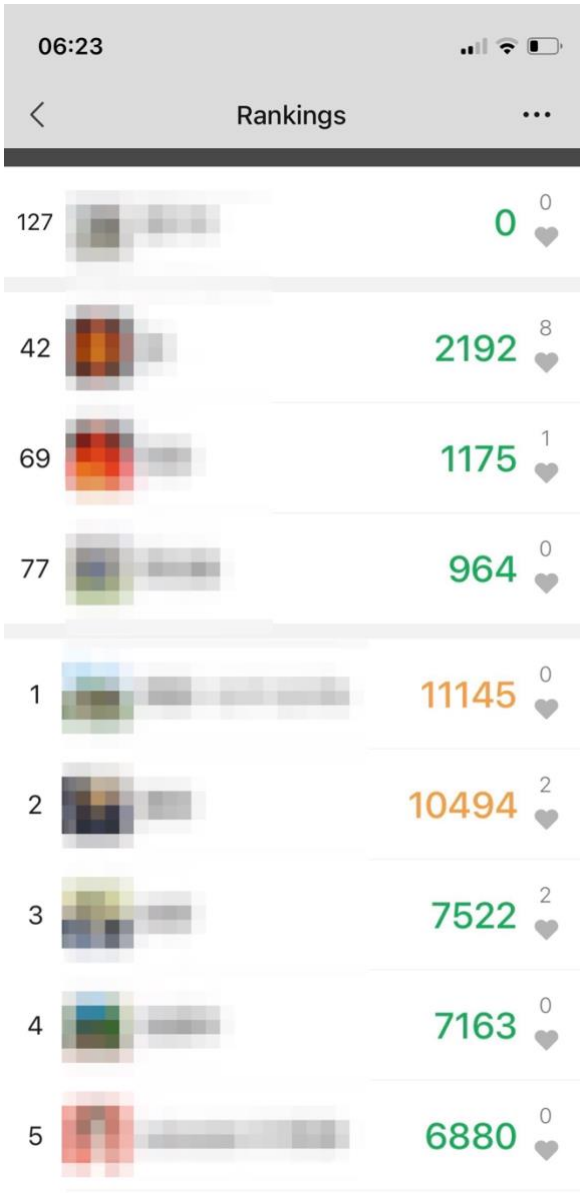


Figure 4.4: Screenshot of a step ranking on WeRun on WeChat

The notification function was used by several participants to update their real-time data (exercise, fitness training, and heart rate) while exercising or to remind them to stand up, walk around, or exercise. It reminded people of other kinds of information such as recommended advertisements, which most participants found annoying.

Communicative and social functions are also built into self-tracking technologies, its interactivity allows connections between different digital technologies (shown in Figure 4.5). For example, WeChat has become a form of self-tracking whereby self-tracking companies create public official accounts and allow self-trackers to engage with their data through the app. For example, Ying logged her smart weight scale on both the app and its official account on WeChat and preferred to check her weight on WeChat, which was convenient for viewing

data. The WeRun feature is open to many Chinese self-tracking apps. For instance, many participants shared their exercise data (such as steps, running, cycling) with WeChat and this type of data was transferred into step data on WeRun. The technologies also allow human interaction with others (shown in Figure 4.6) as they are connected to other social media platforms where self-trackers can directly share their data from devices and apps to third-party social media platforms. Self-trackers could share their experiences, stories, and data within the apps, and share their data with family, friends and other self-trackers on other platforms. For example, Wen mentioned that she saw people's conversations about intimate stories or pregnancy experiences on the fertility tracker Meetyou. The other form of communication involved sharing one account on the same app/device, for example, Yiyi and Pang both shared their accounts with their boyfriends to respectively track their bodyweight and mensuration cycles.

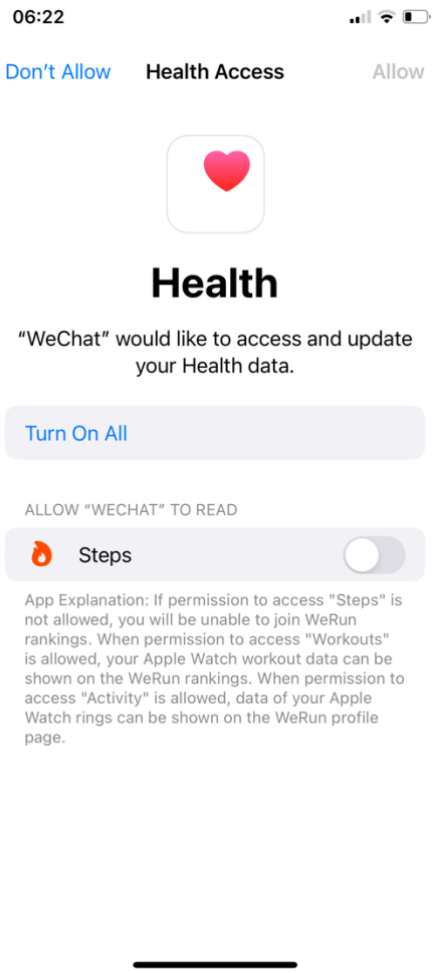


Figure 4.5: Screenshot of notification connecting the Apple Health app to WeRun

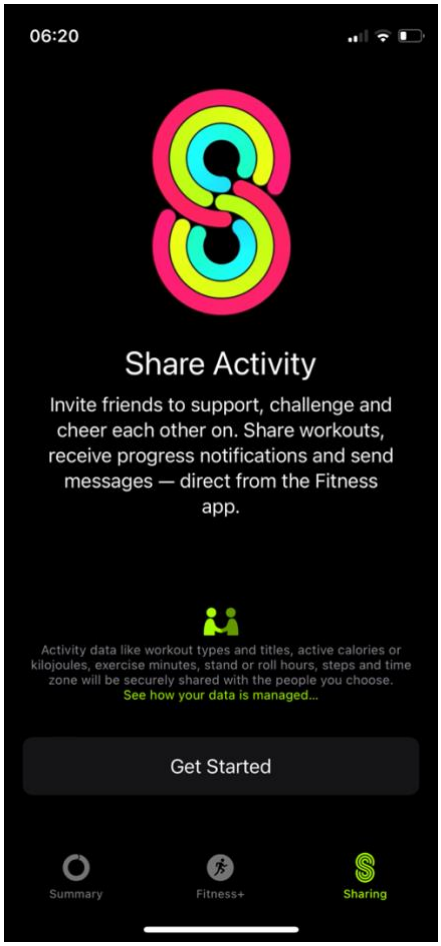


Figure 4.6: Screenshot of social function on the Apple Fitness app

In addition to the functions of the technologies discussed above, some other functions were less common in the technologies used by participants. Other functions that were unrelated to self-tracking were useful for some participants, including being waterproof, vibration sensor alarm, alerts (phone calls, messages, and find a phone), and mobile payments. Participants tried to make good use of these features to meet their personal needs. The waterproof function aims to prevent accidental damage when worn in water, such as swimming, taking a shower, or running in the rain. Although some smart watches and wristbands (Apple Watch, Huawei wristband) have a waterproof function, the participants used them differently. For example, Wen initially distrusted whether her Apple Watch could safely be protected from water in the swimming pool and after confirming this with the Apple company by phone, she eventually decided to track her swimming. However, some of her colleagues told her that they still doubted this function and preferred to track running instead. Zoe aimed to track as much data as she could, so she wore her Huawei wristband with the waterproof function for almost 24 hours, even when she was taking a shower.

Vibration alarms were commonly used for waking self-trackers up. For example, Yang liked to wear her Apple Watch to gently wake her up with vibrations in the morning. The sensor

alerts can remind people of incoming messages and phone calls, or avoided distractions from messages. For example, Jiankun explained how he used this alert function:

> The main purpose of wearing this wristband is to make my mobile phone silent. I don't like being disturbed when I am working. When important phone calls come, my wristband vibrates. (Jiankun, 37, male, energy company employee, cancer, initial interview)

The find a phone function relies on Wi-Fi and Bluetooth to search for phones using approximate distance. Technologies such as the Huawei wristband and the Apple Watch enabled the participants to pay for bus tickets and other bills. The News function was built into some apps such as fitness apps (like the the JoyRun app) and fertility apps (including Meetyou) to attract people to read news, which often provided useless information, according to participants.

This section has given an overview of the diversity of technologies and functions people use to further demonstrate how people track with such technology. It also discussed various functions of self-tracking technologies and their corresponding features, which will be discussed throughout the thesis to develop a picture of how people track, feel, and share differently towards self-tracking practices and data. These devices and apps inspire different ways of using their features. Chapter Five talks more about how people decide when to use the features, how to use them, and what they use them for, by considering everyday aspects of self-tracking practices.

4.4 Why Track: Broad Types of Motivation

The frequency of engaging with these activities varies for a several different reasons. Additionally, some participants temporarily stopped tracking certain activities, while several permanently stopped tracking activities that they previously engaged with. The variety and changes of these activities will be noted in the detailed discussion in this section. A range of motivations for self-tracking have been found in this study. This section provides a broad overview of types of motivation.

Motivations can relate to health management. Some motivations link to family health histories such as heart disease or disease prevention that motivate people to self-track to reduce risk. Some motivations link to specific illness periods that people had, such as depression, cervical polyps or cancer, so that their use of the devices and apps was aimed at having a healthier body.

Developing a good lifestyle is another key health consideration with self-tracking. Some motivations link to fitness where self-tracking technologies are used to improve techniques such as running speeds and endurance, and real-time adjustment of heart rates during exercise and completion of marathons. These improvements encourage people to continue active lifestyles. Some motivations involved developing good habits such as regular workouts,

steady sleep patterns and a good diet. People incorporated improving their fitness into being a reflexive disciplined subject who was able to take control of their life, as fitness is seen as a moral identity and obligation for the neoliberal subject.

Additionally, motivations relate to bodily symptoms such as back pain. Some motivations link to self-knowledge through the data in relation to an individual's body. People collect data about themselves to reflect on their bodies and health states (Lupton, 2017b), and their aims for self-knowledge often relate to various bodily parameters (Heyen, 2020). Some motivations link to fertility as people pay close attention to bodily parameters such as menstruation cycle, mood, body temperature, and pregnancy.

People are also driven by an initial curiosity and exploration about self-tracking devices and apps (Sjöklint et al., 2015). Curiosity leads some participants to explore self-tracking technologies and attracts them to occasionally self-track, but this can disappear when people lose interest in self-tracking. Curiosity also inspires self-trackers to explore how the technologies work and how accurate the self-tracking data can be. Other motivation relates to entertainment such as gamified self-tracking, which involves receiving rewards such as money or certificates. Communication and socialisation through self-tracking motivates people to adapt to their social communities such as company and running groups by changing to use the same devices and apps as other community members.

In this section I have briefly discussed people's five main motivations for self-tracking: health management, monitoring bodily conditions, curiosity about technologies, entertainment, and communication and socialisation. In the next chapter about differences in self-tracking practices I relate this diversity to participants' lives and experiences.

4.5 Discussion and Conclusion

This chapter has summarised the metrics people track, the devices and apps and the functions people use, and motivations of self-tracking. All my interview participants used more than one app or device to track different things in everyday life and they use their own apps and devices differently, although some may stop their devices and apps, temporally or permanently. I found that people who use a particular app or device might do this differently from other people who use the same app or device. For instance, some people used WeRun to track steps, while others used it for communication purpose in talking about their step rankings. I also found that people may also use multiple devices/technologies to track a single parameter, leading them to compare the same data on different apps. Also, people may track multiple things using a single technology, such as using a comprehensive device or app to track running, heart rate and menstruation cycle; and people may also use multiple devices/technologies to track a single parameter, such as Xi using a Fitbit and a notebook to track fitness data. Overall, this chapter suggested that people track different things using different technologies. These differences are linked to personal lives and might change over time, which is further discussed in the next chapter. Additionally, this chapter discussed the

success and failure of technologies in real-life practices of self-trackers, and a combination of digital technologies and traditional tools for self-tracking.

Chapter 5 Variations in Self-Tracking Practices

5.1 Introduction

People engage with various activities in their daily lives: they eat, drink, sleep, work, study, go shopping and work out; they are ill, emotional, healthy, and social. Along with the development of digital technologies, people's lives have become digitalised, and their bodily conditions have been transformed into quantified digital data. Self-tracking studies have often investigated one type of self-tracking activity, such as menstruation, weight loss, cycling, or other physical activities (Didžiokaitė et al., 2018b; Karlsson, 2021; Lupton et al., 2018). At the same time, it has been shown that people engage with more than one type of self-tracking activity, and they track different things, such as sleep, expenses, or physical exercise (Lupton and Smith, 2018). Some self-tracking scholars (Lupton and Smith, 2018; Weiner et al., 2020) have found that people track many different things through self-tracking technologies and track them differently. As discussed in Chapter Four, people use various devices, apps and traditional tools to track one or multiple metrics in different ways. The discussion demonstrated such differences in self-tracking practices through engagement with the technologies. This chapter will discuss such differences in reference to personal mundane lives and changes over time.

Previous research has addressed differences in self-tracking from different angles. It is divided between discourse analysis of marketing and devices (Chen, 2018), which tends to use a Foucauldian perspective (Ajana et al., 2021), and a user perspective (Weiner et al., 2020). Existing scholarship (Lyall and Robards, 2018) has illustrated the diversity in peoples' aims or motivations for tracking and how they relate to the data this generates. It has also demonstrated the diversity in the types of things people track and the materials/devices they use to track them. For instance, some scholars (Lupton et al., 2018; Weiner et al., 2020) look at a particular type of activity and explore how people approach it differently with a particular type of device. Others research is focused on particular typed of activities that people record using different devices. For example, Sharon and Zanbergen (2017) suggest that people track different things, from sleep and food to moods, and identify four different things that QS members do and what data mean to them. Weiner and colleagues (2020) suggest that people track blood pressure or BMI in different ways such as through digital technologies (Samsung Health app, MyFitnessPal) or by pen or digital spreadsheets. In the last chapter's overview of various features, devices and apps, my participants' different self-tracking practices were highlighted.

As discussed here and in Chapter Two, previous studies presented different ways of engaging with technology and data in daily life, although differences have not been central to their research focuses. It is necessary to research everyday self-tracking by exploring individuals' experiences and lives, as self-trackers engage in this activity for various purposes and in complex and diverse ways. In this chapter, I aim to fill a research gap by investigating the differences of digital self-tracking in everyday life. Researching differences in the Chinese

context is another core original contribution that this chapter will make. Some differences have already been observed in relation to committed trackers in the US, but this study shows the different dynamic found among ordinary trackers in a Chinese cultural context. In the current literature, there is little knowledge about how ordinary Chinese people track differently in China compared to those in the West. Paying attention to the Chinese context can add to knowledge of diversity of self-tracking and data meanings and contribute to a better understanding of different meanings of data for people in their everyday data practices beyond the West.

The key point of this chapter is about the intersection of differences relating to tracked activities; self-tracking technology; and people's personal lives, which are combined in each self-tracking moment. In this chapter, findings suggest that selfcare motivates some people to self-track. Some participants said that they wanted to track activities (exercise, heart rate, sleep and menstruation cycle) whenever they engaged with them, as they aimed to produce and use the self-tracking data for their purposes. For instance, Wen explained that "as long as I can wear the Apple Watch, I would wear it. I want to know how many steps I walked during the day. Otherwise, I'd feel bad about losing the data" (Wen, 28, female, primary school teacher, repeat interview). Thus, daily activities and self-tracking are considered together in this chapter. Self-tracking made the activities those people participated in tangible, visible, and meaningful.

My findings contribute to debates about differences in self-tracking practices. They relate to the first research question, about how people track differently concerning different kinds of tracking practices, experiences, and attitudes towards using devices, apps and the self-tracking data they produce. It also addresses the fourth research question, which places the findings in the context of existing scholarship on self-tracking and considers how findings in the Chinese context differ from the existing scholarship. The second section of this chapter focuses on how the different personal lives and experiences of self-tracking relate to individuals' various work situations and diverse experiences, as well as different levels of knowledge about activities that they track as well as the technologies themselves.

In the third section, I show that people sometimes track multiple things using a single technology, that they may also use multiple devices/technologies to track a single parameter, and that individuals who use a particular app or device might self-track differently from others. This links to the last empirical chapter, which focused on Chinese people's self-tracking activities and uses of devices and apps and motivations. To continue the discussion of self-tracking practices begun in the last chapter, the second section of this chapter will discuss these differences in depth in relation to features, devices and apps, and the data produced through these technologies. The discussion will emphasise the role of people in using self-tracking technologies in their everyday lives, how people use devices and apps, and how they engage with self-tracking data. People use these technologies' features in different and creative ways. Finally, the fourth section shows that some people change their self-tracking practices over time. It will also focus on discussion of differences that relate to the Chinese context.

Through exploring intersecting differences in self-tracking practices, the theme of everyday agency emerges across the whole chapter, leading me to reflect on technology agency and user agency. Previous studies have debated the complex relationships between humans and technology. One core sociological debate refers to structure versus agency, highlighting the significance of human agency (Alkire, 2005; Danesi et al., 2018). Technological agency refers to when technology makes people act in a specific way, and user agency means that users make their own decisions about technology. Different affordances of self-tracking devices and apps sometimes shape how people track, why they track, and how they understand their self-tracking data. At the same time, different people use the same types of devices, apps and their features in different ways, demonstrating user agency. The chapter shows how people sometimes enact agency in working and personal lives, and sometimes they struggle to do so. Whether technology determines or is determined by technology or users has been a central topic of discussion in fields like science and technology studies (e.g.Hutchby, 2001; MacKenzie and Wajcman, 1999). I argue that interactions between technological and user agency play an important role in producing differences in digital self-tracking practices.

The chapter first discusses how people's different lives lead to different self-tracking practices. It then focuses on how people use the same types of common features differently and use less popular features creatively. The final discussion section relates to context – for example, seasonal changes or the specificities of the Chinese context – in self-tracking practices.

5.2 Different Lives, Different Self-Tracking Practices

This section focuses on the role of personal lives in engagement with technologies and data. Different mundane personal lives lead to different self-tracking practices. In this study, personal mundane lives mean people's work lives, domestic life, and experiences of using other digital technologies. These three aspects of personal life relate to people's various self-tracking activities.

5.2.1 People's working lives in urban Chinese cities

Work is a central part of the daily routine in urban living. Most participants clearly expressed that the life they wanted involved a healthy body, a good lifestyle, a good balance of work and personal life, and leisure time for hobbies. I identify this kind of life as a balanced urban life. However, in answering the questions "what does your ordinary life look like" and "do you balance your work and life", most participants said they were busy with work although they kept trying to balance work and personal life. Different working patterns and the nature of work lead to different methods of self-tracking, and self-tracking practices can change along with working conditions.

Overtime work patterns significantly impact both self-trackers' participation in activities and self-tracking routines in terms of whether, when, how often, what, and how to track. As explained in the introduction, engagement in activities and self-tracking often intersected and were inseparable. Therefore, participants who worked overtime had little time to participate in practices such as exercise, which meant that they had little time to engage with self-tracking, as this work culture reduced their opportunities to participate. According to Hang (2021) and several participants, such as Pei, Zoe and Yiyi, the 996 working hour system as one type of work culture means people start work at 9am and leave at 9pm every day and work for 6 days a week; the 995 working hour system lasts for 5 days each week. For example, Pei, a 35-year-old man who works as a video coding developer in an information technology company often works overtime until late evening and has little time to exercise. In his company, Pei works 996 one week and 995 the next. As a standard example of software engineers who work in the Chinese IT industry, Pei frequently mentioned the busy working life he experienced:

> In this industry it is quite hard to balance life and work. Experts in this industry basically all throw away their person life. (Pei, 35, video coding developer, male, history of shingles, initial interview)

Since Pei had shingles in 2016, he began to care about his immune system and paid attention to exercise to maintain a healthy body. He tried to often check daily steps on WeRun as well as track his running on the Huawei Exercise app whenever he could find some free time. However, there were few opportunities due to his working life:

> It is hard to balance work and life. In Beijing many people like me face this issue in this industry. For example, the big companies such as Baidu, Tencent have gyms in their office buildings. When I worked in Baidu, I often ran in the gym. However, except for big companies, small companies do not have gym facilities. I work in Haidian district but live in Changping district… If I don't drive, I have to set out from home at 7am and finish my work at 9pm and arrive at home after 10pm. It is unlikely for people to run between 10pm and 10.30pm. It is my situation anyway and cannot present everyone's life. (Pei, 35, video coding developer, male, history of shingles, initial interview)

Pei's account suggested that he barely had time to exercise so he regarded walking as a type of exercise at least. He only tracked running if he could finish work and then arrived home before 7pm. Alternatively, he self-tracked running on the weekends if he could find some free time. In general, Pei let WeRun automatically track his steps every day and reviewed his step data when the app's notification reminded him to check it; he also tracked running on the Huawei Exercise app every three weeks. Since he started to work professionally in the IT industry, he described how his tracking experiences heavily related to his free time and work culture and commented generally on how his work situation pushed him to work out:

> Of course, I hope my body is better and healthier. In fact, first, you possibly do some exercises if you have spare time. That is, you have plenty of time just for yourself and you can control this time period, and then of course you can exercise. Also, you might

> start to work out like push-ups or run outdoors, when you see news reporting that your peers in the Internet industry have died by overwork. (Pei, 35, male, video coding developer, history of shingles, initial interview)

The importance of the time tracking took place was highlighted by a few participants like Pei, Tiyu and Zeyu, due to the daily data reset time on WeRun. As discussed in Chapter Four in relation to features of devices and apps, the data collection feature was only available in WeRun, which was different to features on other devices and apps that participants used. Many participants who used WeRun on WeChat to track and review daily steps said that they ensured they collected step data before 10.30pm every day. Otherwise, their step recordings were cleared to zero by the analysis algorithm on WeRun by the end of the day. Pei decided to track his runs when he could ensure he would produce data before 10.30pm. However, his work situation prevented him matching the time setting algorithm on WeRun, which stopped him from exercising and tracking runs in the evening. This example represents how the overtime work culture in China occupies most of the time in everyday life for some people and how work life balance matters to self-tracking routines.

While not necessarily part of the 995 or 996 culture, participants who worked in other industries such as education, self-employment and law were also busy with work and were distracted from participating in activities and self-tracking. Due to their busy work lives, they struggled to regularly follow the self-tracking routines that they aspired to and lacked energy or time to pay attention to self-tracking data. For example, Xi, a 25-year-old postgraduate student, lived with her boyfriend in Beijing during the lockdown after her master's graduation in the UK. She recounted that she had had depression and an eating disorder in the past and was obsessive about weight, and through self-tracking she aimed to lose weight, prevent depression, and maintain a healthy lifestyle. In Beijing she used a few apps (Fitbit, Apple Health, Weight Loss Journey, PinkBird) to separately track each type of activity: workouts and steps, steps and sleep, weight and period, and she used a notebook to track fitness, reading, water intake, food consumption, and other daily stories as shown in Figure 5.1. She viewed her self-tracking data every day when she was free. After her initial interview, she was able to go out every day after the lockdown, moved from Beijing to Shanghai, started her first job and became busy with work. Therefore, she stopped viewing most of her self-tracking data and stopped recording her life with a notebook, except for tracking her menstruation cycle:

> Since I started to work, I realised that it was absolutely impossible to continue recording those things as I used to do. It requires a super high standard of regular lifestyle. After daily work at 5pm or 5.30pm and arriving at home at 6.30pm, I cannot continue tracking these things, especially as I have to work overtime every day. (Xi, 25, female, marketing officer, history of depression and eating disorder, repeat interview)

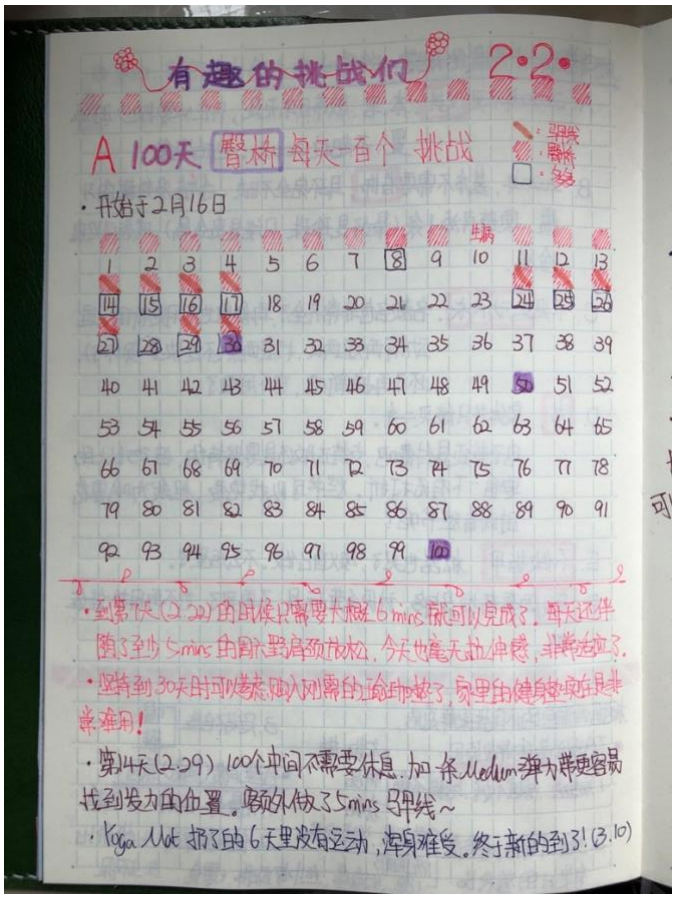


Figure 5.1: Xi's self-tracking with a notebook: tracking 100 hip bridges each day for 100 days and vest lines since 16th February, as well as self-reflecting on exercises and feelings about training

Similarly, as a head teacher at a primary school, Wen usually tracked swimming and calories on her Apple Watch, her menstruation cycle on the Meetyou app, workouts and calories on the Switch Ring Fit Adventure, and weight on the Lexin Scale. However, she stopped tracking physical exercise and weights and viewing data except for tracking her menstruation cycle whenever she was busy with work. Her busy work life changed the way in which she viewed the data:

> I am too busy to exercise. Of course, I want to work out. I clearly know I didn't exercise so I don't really want to check my daily calories because I knew I didn't burn off much during the day by walking. (Wen, 28, female, primary school teacher, repeat interview)

These participants' experiences show how work affects methods of tracking and viewing data and that participation in both activities and self-tracking requires time investment and extra effort to maintain regular self-tracking routines. A busy work life reduced people's time and headspace to not only do things to look after themselves like sleep more, run more, and

manage their weight but also to engage in self-tracking these things. As described in Chapter Four, features of devices and apps and the nature of self-tracking itself help to motivate people to do things. However, as mentioned in the introduction, having time to do things makes self-tracking become more meaningful.

Sometimes people had to give up tracking activities that required more time investment but kept tracking things that needed less effort. Compared with tracking menstruation cycle, engagement with other activities, actively tracking them and making sense of data (such as participating in and tracking exercise and fitness, monitoring weight, eating healthily and tracking food consumption) required more free time and more effort to maintain their regular lifestyle and daily routines. When work interrupted people's lives, it was hard for them to follow the routines that participants had identified as part of a healthy lifestyle and to spend time understanding their self-tracking data.

However, some participants, who saw self-tracking as a key part of living healthily, moved to passively/automatically self-tracking (Abtahi et al., 2020). Some reviewed their data every day, and others did so occasionally. For example, Tingting was usually busy with work, and she relied on WeRun to track her daily walk:

> I don't have a proper time period to walk and don't have a chance to pay attention to self-tracking, when I am busy with work at school during the day. I usually check the data and my ranking list by the end of day. (Tingting, 33, female, teacher at middle school, cervical pain, initial interview)

Similarly, other participants' work situations limited their self-tracking abilities, while several participants, such as Pang, Yiyi and Xinyue, found means to engage with self-tracking and aimed to use technology to help them live a good life. These participants worked in the Internet industry and followed a relentless schedule, including working overtime. They were also clearly aware of poor work life balance, and they had little time for exercise, spending most of their time on work, but at the same time they tended to rely on devices and apps to automatically track their bodies and exercises at least. For example, Yiyi worked in the 996 culture in a successful technology company and she said work occupied most of her day, leaving little time to track exercise.

A busy work life distracts self-trackers from self-tracking practices. In particular, manual self-tracking and traditional monitoring such as pens and notebooks need more effort than automatic self-tracking. This leads to some self-trackers stopping self-tracking temporarily (Weiner et al., 2020). For example, a participant in previous research about voluntary self-tracking (Lupton and Smith, 2018) said that it was important to invest time in consistently measuring things every day to make improvements. Although automatic self-tracking is convenient for people in the production of data, people like Xi have little free time to view their data due to their busy work life. Thus, self-trackers can often forget to track, delay self-tracking, or lose interest due to busy work life and overtime culture.

Self-tracking a menstruation cycle was a special case that was rarely influenced by work situations. No female participants who tracked menstruation cycles stopped tracking period

dates, no matter how busy they were, as discussed earlier by Wen and Xi. Many participants said work increased stress and could impact their periods. This opinion has also been observed in previous studies: Kressbach (2021) found that some self-trackers can discern the relationship between stress and ovulation and likely anticipate this, although they cannot control it. Many participants increased the frequency of viewing period dates if they experienced delays during a busy work period. For example, Yiyi started to frequently check her fertility app during an extremely busy time when her period was late and she was even struggling to find time to have meals.

Several other participants had different work situations and self-tracking routines to those who worked overtime. They were flexible with work and less controlled by work routines and were thus able to focus on self-tracking. For example, Cathy, a 32-year-old self-employed in the health industry, used to follow the 996 work system in big companies in Hangzhou but since she became self-employed she could avoid working overtime and started self-tracking her sleep, running and weight.

Additionally, the nature of work makes self-tracking different. For example, as a postgraduate student, Lele majored in Petroleum Exploration and Development. He explained that after his master's degree he would work in tough environments such as natural oil fields, deserts, and oceans for 28 days after 14-day breaks, which would require excellent physical fitness and a healthy body. He aimed to prepare himself to meet work needs in the future through self-tracking, and he believed that tracking bodily functions and activities was a positive way to manage individual health. Thus, Lele regularly tracked his running, heart rate, steps and sleep on his Apple Watch:

> When you work at sea, you may not get timely medical treatment. This means you need to have a strong body. You eat and sleep in a worse situation in the wild than in a car, and then you need an even stronger body. By tracking the information, I want to make myself stronger and healthier and will be able to adapt to such hard work in the future. Also, I think health is very important and I do exercise and self-track to become stronger (Lele, 26, male, postgraduate student, initial interview).

To summarise, the analysis presents in this section that both looking after oneself and self-tracking require time investment. The differences in self-tracking practices discussed above related to working cultures and to the degree of time people felt they had. Work is situated at the centre of mundane life and busy work life significantly impacts on the ability to follow daily routines and engage in self-tracking practices. The participants complained that this work culture affected their lives and health and limited their engagement with everyday life and self-tracking.

It is notable that time investment is needed by self-trackers when they actively engage with data production. Participants such as Pei, Wen, Yiyi and Xinyue mentioned that they needed enough free time to participate in activities such as running, swimming, and to be able to produce and own their data. Self-tracking data become meaningful when they quantify activities that people pay close attention to. However, overtime work life occupied most of

some participants' lives during the day, which strongly influenced their decisions about whether and when to track. Despite this, some people made efforts to squeeze self-tracking into their busy work lives as taking care of themselves with the assistance of self-tracking played an important role in life improvement. Thus, self-tracking was used as a strategy to achieve a balance between work and life and was expected to be a powerful way to better control personal lives. However, people struggled to achieve their purposes.

The lens of work and self-tracking shows how people apply their agency to fight with the Chinese work system but challenges and failures remain. This is an example of agency in fighting work system that Cathy changed her job to avoid heavy 996 overtime and she opened her own company which allowed her to finish work around 6pm. Although she had more time for herself and her child as a self-employee and enabled to control her time better than the past, the working environment in China sometimes pushed her to start working overtime. Similarly, Hongbin changed to be a self-employee and he became even busier than before, although he reported that he also had relatively more freedom for time management. Despite this, both participants still had to focus on working and needed to find time to exercise, and most of time they replied on passive automatically tracking. Lele proved exception as fitness and good health were occupational necessities for them.

The analysis shows how some participants struggled to balance work and self-tracking for health. Hang (2021) argues that the 996 culture in the Chinese Internet industry represents a "strive culture" and that this working culture violates workers' right to rest and harms their physical health. Researchers explain that strive culture involves people working as hard as possible to achieve their goals (Fu et al., 2007; Song, 2004). For example, Zoe was unable to change her work – she worked until 10pm and usually went home around 11pm. However, since 2020 she became aware of how this lifestyle was impacting her life and made additional efforts to sleep on time and ensure enough sleep by using the Huawei wristband.

Also, many participants were aware that this 996 overtime work culture could affect their health and they had the idea of self-tracking for health. Some devoted more attention to health and self-tracking in order to live more healthily, while others continued living with the 996 work life. As discussed above, Pei continued his original overtime work patterns and made limited efforts to track runs.

5.2.2 Domestic life and self-tracking practices: married life and intimate relationships

Although work occupies most people's time, it does not mean that personal life is unimportant. Self-trackers' children, partners, parents, and other personal daily routines were involved in their self-tracking practices. Married life and intimate relationships heavily impact when and how people track, and how they view, review and understand their data. Married life reduces and interrupts self-tracking practices and even changes ways of self-tracking. Six participants (one female and five male self-trackers) had marriages in which they needed to take care of children and help with spouses' and their own parents, which significantly reduced their self-tracking opportunities, altered their previous self-tracking

experiences and differed from unmarried participants. For example, Pei stopped tracking his fitness training on the Keep app, as his children disturbed him when he was engaging with the training course on the app at home.

Other participants found it was possible to engage with self-tracking practices after marriage, even though they differed with their previous routines. For example, Ben, a 32-year-old hardware engineer, used to track exercises and steps on the Xiaomi wristband and its bespoke Mi Fitness app. He described how he became less interested in self-tracking since he got married and had a 2-year-old daughter, and he spent most of his time on work and spending time with his child, instead of continuing his photography hobby and participating in exercise (running and hike) and self-tracking them:

> Before marriage I was young and liked to participate in activities like photography and exercise outdoors, so I loved to quantify the activities I did via a device or an app. But after getting married and having children, I didn't have enough time to do these things and to pay attention to myself, and my energy was mostly taken up by work and domestic things. So I gradually didn't care about exercises and self-tracking them anymore. I used to view my step data on the Mi Fitness app every day when I received daily notifications from my mobile phone. It was very convenient to see the data by clicking the notification. Nowadays I occasionally check it on the app when I thought I walked a lot during the day, and I rarely checked the steps on WeRun unless I received notifications saying that someone liked my step rank. As I am busy with work, getting older, and considering about many more things, my attention to self-tracking is decreasing. (Ben, 32, male, hardware engineer, initial interview)

Similarly, as wives of participants such as Xinyue and Tiyu were extremely busy with work, the participants were usually responsible for taking children to school, bringing them home, and helping with their homework. They had less time to focus on themselves, including self-tracking practices and their self-tracking routines were based on family routines, particularly children's schedules. For example, Xinyue changed his previous way of self-tracking, sometimes tracking his running when his child went to workshops; or he invited his child and family to run together, which created opportunities to engage in monitoring running activity. However, self-employed Cathy did not mention the challenge of continuing to engage in regular self-tracking and her ability to track sleep, running, blood pressure, weight and menstruation cycle, while taking care of her son. These domestic distractions did not bother the unmarried participants, as their considerations of how, when and what to track were unlikely to be related to their family members' daily lives. These examples show that busy work life and married life distract people from focusing on themselves and led to changes in the frequency and ways of self-tracking and viewing data. This supports Kent's (2020b) argument that it can be difficult for people to always engage with self-tracking and maintain a healthy lifestyle when they have busy or stressful lives.

Self-tracking continues to exist in people lives including in marriage life, but ways of self-tracking and meanings of data change. Primarily, self-tracking data was treated by Ben as a very personal part of the self, as a way of giving attention to himself to help him to

understand the activities and exercises he did, and as part of living healthily when he felt "bodily situations became worse during a certain period" (Ben, 32, male, hardware engineer, initial interview). Ben similarly identified himself as an active person due to his interests in data and his occupational background. People's active self-tracking data practices often lost their focus when married lives were involved. Marriage provided self-trackers with new responsibilities, which sacrificed their interests in self-tracking for the self. Despite this, they took advantage of automatic and passive self-tracking via mobile applications.

Devices for self-tracking such as the Xiaomi wristband are physical materials that touch people's bodies, which immediately builds connection with the self. The moment self-trackers physically feel the materials can immediately draw their attention to themselves and remind them of actively engaging in self-tracking. Automatic and passive self-tracking by mobile applications created connections with people through notifications, so they could decide whether and when to engage with the data and what data they were interested in. The difference in attention given to the self between devices and apps can explain why Ben decided to significantly reduce his time in actively self-tracking and stopped using the wristband but retained both its bespoke app and WeRun.

Intimate relationships as an important part of domestic life create new ways of self-tracking that differ from people who self-tracked alone, and the relationships lead to different uses of self-tracking and data. The relational aspects of self-tracking show the intimacy of relationships in terms of romantic partners, family relations and friendships, and the effects they have on self-tracking practices. This is also related to communicative aspects of self-tracking, which is discussed in detail in Chapter Seven.

A few participants monitored activities together with their partners. For some of them self-tracking practices became a way of maintaining good intimate relationships. In a study of meanings of self-tracking that was integrated with intimate relationships, Pink and Fors (2017b) note that self-tracking technologies provide opportunities for people to maintain relationships in private ways. For example, some participants, such as Yiyi, Xi, Pang and Ying, tracked their weights with their boyfriends as a way of taking care of each other. Alhough sometimes they weighed themselves separately from their partners, they talked about the relevant data afterwards. When intimate relationships were involved in self-tracking practices, self-tracking was regarded by the participants as not only intimate surveillance for weight loss but also a way of showing love to their partners. Will and co-researchers (2020) described the concept of intimate surveillance in tracking health-related activities including weight and blood pressure as caring for partners and taking responsibility for motivating each other and maintaining health together.

This intimate aspect of self-tracking could only be seen when those participants let their partners participate in their individual self-tracking practices, which was different from those who self-tracked alone. For example, Yiyi was a 29-year-old Internet operation planning officer at the one of the biggest Chinese technology companies and lived in a separate city from her boyfriend. She tracked her weight on a smart scale and menstruation cycle on the Period Helper app and communicated with her boyfriend about weight changes. Due to his

intimate surveillance and suggestions, Yiyi started to pay attention to not only her weight, but also food consumption and daily workouts. She started to track indoor exercise along with her weight to lose weight, as her partner was worried that she had lost too much weight, which was unhealthy. Yiyi understood the practice of self-tracking weight for weight loss along with her boyfriend as a "way of showing love and supporting each other to become healthier" (Yiyi, 29, female, Internet employee, initial interview).

Another example of tracking with partners was Pang, who tracked her menstruation cycle with her boyfriend to schedule sexual activities and prevent pregnancy. In this case, the use of self-tracking data became an important part of planning her sexual life. Pang was a 28-year-old lawyer's assistant and tracked a range of things. Both her partner and she were busy with work, and they usually had little time for sex, so checking her period dates was important for them to make decisions to plan their sexual life before around her periods.

However, intimate surveillance can limit self-trackers' willingness to self-track together. Researchers (Pink and Fors, 2017b; Will et al., 2020) suggest that intimate surveillance can be experienced as a form of control. Several participants said that they tended to avoid this intimate surveillance when they felt pressured and controlled, but their self-tracking practices were not affected by intimate surveillance.

Although Yiyi appreciated her boyfriend's love from a distance, she felt pressure from him and felt that she was being told by her partner that her weight should be in a certain range and weight loss should be systematic. Yiyi was sometimes annoyed and tried to meet her boyfriends' suggestion to lose weight systematically by combining exercise with healthy diet. Later, her boyfriend thought she was thin enough and should not lose any more weight, but she still continued tracking her weight.

When intimate surveillance disappeared from people's personal life, they gained freedom back and self-tracked in their own way. For example, Xi used to track her weight and reduce her carb intake with her partner but she failed to manage this, as her boyfriend struggled to maintain this lifestyle. Since she moved to Shanghai and lived separately, she felt freer to start to follow her original self-tracking habits without input from her partner.

5.2.3 Personal schedules and variations in self-tracking routines across daily life

As well as taking care of work and domestic life, people still focus on themselves in everyday life. Self-focus was an important part of their daily lives, such as developing personal interests (running, cycling, eating), having fun with family and friends, travelling, studying and preparing for career development. Self-tracking practices sometimes needed to be scheduled and helped to organise their lives.

Participants altered their self-tracking habits to fit their routines. For example, as a PE teacher at a middle school Tiyu usually tracked his steps on WeRun in the playground at school during and after sport classes, while he used the Gudong app to track running-related

parameters when he planned a serious run. Similarly, Xinyue tracked runs in everyday life differently from the way he prepared for a marathon. He casually tracked running without any plan due to distractions from work and family. However, he began regularly self-tracking for six months with no break if he planned to participate in a marathon. He often checked his running data for daily self-tracking practices, and for preparing for marathons he reviewed the previous running data after tracking for a certain period to see data changes to improve it at the next stage. Therefore, decisions related to casually and regularly self-tracking running activities relied on whether new activities in relation to self-tracking were planned. Casual self-tracking was incorporated into routine lifestyles. Regular self-tracking usually related to serious self-tracking purposes such as goal achievement.

The life changes of some participants made it hard for them to follow their original self-tracking routines and could even stop their self-tracking activities. Such life changes related to the availability of gyms and swimming pools, different lives at home, at universities or in other cities. For example, Zeyu tracked food consumption differently when he lived with parents at home than when he lived alone at university:

> Sometimes, I search for meals' names on the app instead of taking photos. As I don't think it is polite to take photos of food in front of my family, I prefer to do it when I go back to my bedroom and start to track my food consumption before I go to bed. (Zeyu, 20, male, undergraduate student, experience of treatment in hospital, repeat interview)

In another example, Yueyue, an undergraduate student, used to regularly track runs and walks on the Keep app at university. When I tried to schedule a repeat interview with her, she explained she had completely stopped tracking things since she began her new university life in the US. In both the initial interview and the follow-up chat, she mentioned how her new life often changed her self-tracking:

> I used to track my runs regularly at the playground in China. But when I moved to the US, I can't find a gym near the university yet and need to adapt to my new life here. I might start to track things again in the future. (Yingyue, 22, female, undergraduate student, follow-up chat)

> I used to track the time of getting up and falling asleep as well as track how long I slept overnight by the Apple Health app. But later I didn't continue tracking it, because I had to deal with different things every single day and could not sleep on time as I expected. (Yingyue, 22, female, undergraduate student, initial interview)

Engagement with self-tracking needs a regular life pattern, and new schedules can break original self-tracking routines and sometimes even result in people stopping self-tracking. Many participants had the same strategy whereby they only used devices and apps if they knew their data would look good, otherwise they avoided self-tracking and viewing data. Although the strategy was the same, it changed according to individual needs. For example, due to preparations for her law examination, Pang avoided tracking her weight:

> I clearly knew my data must look terrible. [laughs] So I just don't track my weight until I start physical exercises after my examination. Also, if I stop exercises, weight data becomes meaningless as well. Personally, I refuse to weigh myself if I feel I might put 2 or 3 kilograms on. My boyfriend does the same. (Pang, 28, female, assistant lawyer, history of depression and cervical polyp operation, initial interview)

These examples show that the participants engaged with the same type of self-tracking differently under their various personal life conditions. In contrast, tracking menstruation cycle for some participants was used to help them schedule their lives. For example, Pang started to combine taking contraception pills with the menstruation cycle dates on the Clue app to make appointments for her important law examinations, which was different to her usual habit of self-tracking her periods. Similarly, Yiyi used her period dates to plan her spa days with friends for holidays. Menstruation cycles can be continually tracked because their pattern comes from the body (Karlsson, 2019), which cannot be immediately changed by life routines. However, self-tracking routines can be changed any time when self-trackers; for these individual cases the data was treated as part of everyday life.

This section has addressed everyday schedules and variations in self-tracking across time and place. Participants varied their self-tracking based on their goals at the time (e.g., tracking casually, or seriously with a specific goal in mind). Tracking might also vary by location (e.g., doing something different when living with parents than living on one's own). Engagement with self-tracking sometimes waned when participants did not have time to do it to their satisfaction. Finally, menstruation tracking might be used to help schedule other activities. In this section I have talked about relationships between everyday life and variations in self-tracking. In the next section I will move on to talking about the different uses of specific devices and apps.

5.3 Different Uses of Technologies, Features and Data: Notifications, Goal Setting, Gamification and Other Functions

This section considers the different ways participants related to the main features of self-tracking technologies. As discussed in Chapter Four, self-tracking devices and apps present a range of features, however, individuals use them differently. To understand the variations in how people use devices and make use of the different features requires an exploration of who these people are, what they want, and what they track. The previous section gave a sense of who the people are and how these individual mundane lives are linked with variations in self-tracking practices. This section uses the three most common features – notifications, goal setting, and gamification – as examples to explain how people use such features to self-track in different ways. These three types of features are common to general digital technologies and in specialised and comprehensive self-tracking technologies. This section also discusses how people used self-tracking automatic and manual functions differently.

5.3.1 Notifications

Notifications are one of the most common features of apps and used in different ways by users. They are popular for providing real-time data to help self-trackers make real-time adjustments during self-tracking practices. Notifications regularly remind people to start self-tracking or to check their self-tracking data (Lyall and Robards, 2018) in various situations. Smart watches and wristbands that send such notifications remind participants about standing up, breathing, walking, or their heart rate. For example, Xinyue, who regularly tracked running on the JoyRun app, relied on voice notifications to monitor real-time data, including running speed, distance, and time. He said that it was important to monitor running distances and real-time heart rate. If he ran too fast at the beginning, he might be too tired to keep running; the notification function was helpful for self-motivation to continue running during marathons. People such as Yang and Wen who wore wristbands and smart watches often received vibration notifications that played the same role in their self-tracking practices. For example, Wen used vibration notifications on the Apple Watch while swimming, which gave her a sense of swimming distance and an adjustment of heart rate. Similarly, Pei treated the voice notification as a method of self-motivation. He was not keen on running, so he needed to cut his running distance goals into subgoals of smaller distances:

> I read in a book that an excellent runner sets 10,000 metres as his overall goal but cuts it to be every 1,000 metres as a sub-goal and then he can successfully complete the competition. By using this app, when I am running, I need to encourage myself to complete every kilometre as a goal to motivate myself to keep running. (Pei, 35, male, developer, initial interview)

Xiaoyang was concerned about her heart rate due to a family history of heart disease, so she not only monitored her heart rate whenever she received a notification but also voluntarily tracked her heart rate whenever she had a free moment. However, not everyone followed ways of self-tracking that notifications suggested. For example, Wen usually ignored this type of notification on her Apple Watch, unless she felt stressed by working indoors for a long time and then she started to concentrate on her breathing or to stand up for a while. She never used the breathing function to seriously monitor her breathing by following the voice guide.

These types of real-time notifications can be treated like humans. For example, Jiankun lived alone in Beijing with cancer, and he aimed to live healthily by self-tracking. He found it hard to find a running partner, so he regarded the real-time notification on the Nike app as a ‘friend’ to encourage him to keep running, such as when the notification made a “come on” or “well done” sound (Jiankun, 37, male, energy company employee, initial interview).

A few participants used notifications to live easy lives, as alarms, phone calls and messages. The other type of notification sends different types of reminders such as recommendations, answering phone calls, checking messages, finding mobile phones, and vibration alarms. Although only a few participants, such as Wen, Xi, Yang and Yan, used notifications for convenience, they said that they were the second most important feature besides self-tracking

features. These notifications bring convenience as they digitalise people's daily activities and help them to quickly deal with information (Lu et al., 2021b; Lyall and Robards, 2018).

Therefore, people used voice and vibration notifications as an instrument to receive real-time metrics to pace and motivate themselves to continue activities such as running, cycling, and swimming. They were also used by some people for emotional encouragement and voice recognition of their achievements. Although participants mainly used this type of notification for self-encouragement, they used this feature slightly differently in accordance with their different self-tracking conditions. In short, some participants actively responded to notifications while others responded selectively; other participants ignored notifications, and many turned them off completely.

Through notifications, users checked step data on WeRun and quickly glanced at who had liked their steps. However, a few participants, such as Ben and Tiyu, ignored this type of notification and only viewed their data when they wanted to. Many participants eventually turned off this type of notification and only started to engage with self-tracking when they felt like it. For example, Yiyi explained how she selectively turned off notifications:

> I barely turn on any notifications on mobile apps. My habit is to check the apps and information actively as I have so many apps on my phone and the information is messy. I have a bad obsessive-compulsive disorder, and I feel tired when it comes to clicking on all the red notification spots. Nowadays I only have notifications for under ten mobile applications such as my own company's app, the TouTiao News app, WeChat and some bank apps. (Yiyi, 29, female, Internet operations planning officer, initial interview)

Figure 5.2: Screenshot of Ben's notifications, including step data

People had their own ways to set up receiving notifications. For example, as seen in Figure 5.2, Ben usually checked his step data through the overall notifications on his mobile phone, as he had little time to exercise and self-track, as discussed earlier. Some participants, such as Yiyi, Cathy, and Xi, often followed notifications from self-tracking devices and apps to check their data. All these examples show the user agency involved in notifications. People make efforts to carve out some free time regarding when and how they use the technologies and view their self-tracking data if they can. As Lomborg and others (2018) note, user agency can be seen when individuals interact with the system.

5.3.2 Goal setting

Setting goals is the other most common feature of the self-tracking technologies. People have their own ways of doing this for specific achievements and experiment with different methods. It was common for self-trackers to input goals on their devices and try to stick to them, but they often failed to achieve them. However, participants set goals differently. Some participants set goals for certain time periods and once they achieved them, they stopped self-tracking the activities unless this goal was needed again. For example, Tiyu and Xinyue aimed to lose weight, so they carefully stuck to their goals until they achieved them.

Many participants such as Xi, Pang and Tingting carefully set up goals but struggled to achieve them. For instance, Xi set up a goal on the Weight Loss Journey app to lose weight over around five years as she was obsessed with her weight. In addition to weight loss, Xi made goals about drinking water, walking and eating on time on her Fitbit. She then realised that she wasted too much time checking her phone rather than focusing on making efforts to achieve her goals. To avoid this situation, she decided to set up daily goals using pen and paper, as shown in Figure 5.1. However, these goals were not her priorities compared to weight loss and she was busy with work, so she failed to achieve them and stopped tracking:

> I wrote down some questions such as "did you eat eggs, drink milk, and have some nuts?" or "did you drink over 1.5 litres of water?" In the evening, I check what I have done and what I have not done today. If I could make up I can drink milk to complete my goal… I spend a lot of time on analysis of my self-tracking data recorded by pen and notebook… But I am busy and cannot continue recording these things… However, recording weight and menstruation cycle are the only two things I keep tracking whether I am busy or not. It only takes me 20 seconds to go on the scale and then quickly record it. It takes me one second to record my period date. (Xi, 25, female, marking, history of depression and eating disorder, repeat interview)

These examples show that self-trackers often try to use apps to help identify goals and stick to them, but they find it challenging to achieve them. This finding is consistent with the study of goal setting in tracking weight (Gordon et al., 2019) that people find hard to achieve goals for a long time period. To achieve goals, several participants such as Lele, Yang and Xi constantly revised their goals. To complete goals and achieve good data, self-trackers may change goals set for their achievements. For example, Lele changed his activity settings on his Apple Watch until it fit his daily routine:

> I will try hard to close three rings. Sometimes they can't be closed, I revised the setting to make rings smaller as I am tired those days. For example, I changed calories burned from 560 to 450 to make the ring close. Next day I changed the setting back to the normal range again. It is just a tracking tool. When there is no way for you to complete goals, the only thing you can do it to change it to make you look like you completed it. (Lele, 26, male, postgraduate student, initial interview)

Sometimes goals were identified by apps based on analysis of age, gender, height and previous self-tracking data and recommended to self-trackers. A few participants, such as Wen and Yang, accepted the recommended goals for weight loss. For example, Wen accepted a recommended goal by the Apple Watch after she completed her personal information such as weight, gender, age. After self-tracking for a while, she forgot how and why she had set the goal:

> Interviewer: How did you set this goal as 400 burned calories each day?
>
> Wen: Oops, I set this a long time ago. I forgot. It seems like I input my weight and weight goal, and then… how long I aimed to achieve this goal and then it calculated this goal for me. (Wen, 28, female, primary school teacher, initial interview)

However, Ying refused to set up goals for sleep, weight and steps on the Apple Health app and never accepted the recommended goals. Instead, she kept her goals to herself and stuck to them, continuing to self-track as a habit without stopping. As she explained:

> I don't think it is useful to set goals. By self-tracking you just let yourself have an awareness of how fast you can achieve the goals. I had this standard goal [of about 3,500 steps] in my mind already. By viewing my current data, I roughly know how long it will take me to achieve my goals. (Ying, 25, female, Internet employee, initial interview).

In summary, people set goals differently. Some people tried to achieve suggested goals but failed; some revised goals to better fit their actual achievements; others rejected the suggested goals and preferred to create their own. The feature of setting goals does not fit everyone's self-tracking purposes, and it mirrors people's struggles to meet their goals. Although the purpose of this feature is to show that setting goals is a powerful way to continue self-tracking motivations, the reality is it can be challenging to reach the required outcomes. However, self-trackers actively make adjustments to get closer to their goals and some find ways to resist the pressures of such features, and they are not driven by them.

5.3.3 Gamification

The third common feature of the self-tracking technologies is gamification – many apps that participants used were more or less digitally gamified to get people to keep using them as long as possible. Figures 5.3 and 5.4 show examples of when Wen used the Switch to track workouts during lockdown. Many participants showed their enjoyment with the gamified self-tracking technologies with different levels of interest and engagement with this feature. The most gamified devices and apps often provided rewards, including a small amount of money, ranks and achievements, and involved competition and challenges such as boss fights to upgrade the levels in the Switch fitness game.

Wen bought her Switch for exercise purposes when she had to stay indoors and was eager to continue working out during the Chinese COVID-19 lockdown. The Switch has sensors that

connect fitness games and bodies to users and provide scenarios such as fighting monsters; as shown in Figure 5.3, it allows users to follow guidance to exercise while playing a game. Wen found the Switch was more enjoyable to track exercise than having a coach at the gym or following fitness training guidance from other self-tracking devices such as training videos on the Keep app – they did not provide interaction as the Switch did.

Figure 5.3: Screenshot of Wen doing exercise with the Switch Ring (1)

Figure 5.4: Screenshot of Wen doing exercise with the Switch Ring (2)

Wen was the only participant with game-based self-tracking experience using the Switch Ring. Compared with Wen's positive game-based self-tracking experience, other participants engaged with the gamification of devices and apps along with more serious workouts. Participants tried to achieve top rankings and likes in the daily steps competition on WeRun, and monetary and virtual rewards for goal achievement. However, these participants did not express enjoyment with gamification as strongly as Wen, and many of them had little interest in it even though they participated in the games. In contrast, they experienced stressful competition and made extra efforts to achieve their goals, but what they received in return did not equate to their efforts.

WeRun was the most popular gamified app among participants. Its ranking feature motivates self-trackers to compete with others and walk more than other people on the ranking list; the competition ends at 10.30pm every day. Many participants lost motivation to exercise such as walk and run in the evening if it was unlikely that the data would be recorded by 10.30pm. As discussed earlier, some apps such as the Huawei Exercise app shared tracking data with WeRun. The participants who used this type of app in conjunction with WeRun had two reactions regarding when to track. One was if they could not record their exercise as step data, they felt they wasted tracking opportunities. The other was that they should jump up a higher step rank on WeRun if possible. As discussed earlier, Pei was unlikely to run around 10pm after work, as it was impossible for him to finish running before the competition ended at 10.30pm and to compete with others who could run longer than him and produced higher step data than him.

Although several Chinese self-tracking devices and apps allow data to be shared with WeChat, some participants were not interested in WeRun at all. However, sometimes they started to push themselves to walk more than usual if they saw a potential to rank in the top 5 or 10. They even made extra efforts to run or walk to be on the top in the late evening but before 10.30pm. If they assumed that they would not be able to achieve this goal before 10.30pm, they would not be bothered to run or walk. Running was usually the quickest way to increase steps for participants. For example, Pei was busy with work and rarely had a chance to run and mainly regarded walking as a form of exercises. At times, Pei would not bother tracking his run on the Huawei Exercise app if he assumed his steps would not appear on the first page of the WeRun ranking list:

> I can produce 2,000 steps if I drive to work. But when I commute by foot, I can have 5,000 steps after arriving at home at 9pm. The ranking will restart again at 10.30pm. So I check people who are on the first page of the ranking list if they have already walked 10,000-15,000 steps. Then, I think I can produce about 800 to 1000 steps if I run for 1 kilometre. I would have run 5 kilometres to produce 10,000 steps… If I could run 10 kilometres, my steps can rank to the first page of the ranking list on WeRun. This is a joke and not realistic. I cannot run that much this late in the evening. (Pei, 35, male, developer, history of shingles, initial interview)

Nevertheless, many participants said that they found the gamified elements of these technologies motivational. For example, Tiyu commented:

> When I want to exercise and tend to be the top one, I keep walking by comparing with other steps. This gives me a lot of motivation. (Tiyu, 48, male, middle school PE teacher, initial interview)

Other participants tracked physical activities on these technologies while aiming to increase their steps on the ranking list on WeRun. Participants such as Wen, Xi, Xinyue and Tiyu even got out of bed to run or walk more, expecially in the evening before 10.30pm, if they noticed they could not secure a top spot on the ranking. For example, Tiyu described how his experiences of competing with others' ranks on WeRun changed:

> At the beginning when the WeRun feature was first released, people were very happy to compare with each other. Once I arrived at home and got ready to sleep, when I noticed someone had more step data and a higher rank than me, I put my clothes on and continued walking. This was quite an interesting and fun time. But I stopped competing like that later. Because I scheduled my own daily routines for exercises. As you have known its recording time was set up until 10.30pm. I walked until 10.30pm every day. (Tiyu, 48, male, middle school PE teacher, initial interview)

This showed that people like Pei were able to control the extent of their engagement with tracking and reviewing data, while their choices of when to stop tracking steps and exercises were still based on WeRun's conclusion at 10.30pm. Several participants like Tiyu were strongly enthusiastic about the gamified self-tracking steps and other types of exercise that could transfer to step data on WeRun, but their interests in step ranks gradually lessened. For example, Wen's Lexin wristband could share her running data with WeRun and the data could be transferred to steps on WeRun. She monitored real-time running data while checking her rank on WeRun. If the number of her steps was in first place and only a little behind the top place on WeRun, she would "definitely continue running to be the top 1" (Wen, 28, primary school teacher, initial interview). However, since she replaced the Lexin wristband with the Apple Watch, she rarely paid attention to the step data on WeRun:

> I view the steps on the Apple Watch. But I am not interested in steps on WeRun anymore. As the steps on the Apple Watch cannot be counted to the ranking list on WeRun, I don't think the data on WeRun is important at all. (Wen, 28, primary school teacher, initial interview)

However, not everyone was attracted to this gamified self-tracking on WeRun. Other participants such as Xiao, Lele and Yan paid little attention to the ranking on WeRun. Features of other devices and apps such as the Apple Watch, the Yodo Run app, and Mi wristband were partly gamified but only a few participants used these features. For example, as an undergraduate student with no income, Zeyu forced himself to complete daily walking tasks on the Yodo Run app. He aimed to walk more steps than others on the app to win pocket money – a maximum of £0.22 – and automatically received the cash as a form of Red Pocket money through the WeChat payment feature.

Several participants such as Lele and Yang were keen to receive other virtual rewards such as certificates, fireworks and medals. Smart watches and wristbands usually give users medals

or fireworks. For example, the Apple Watch can give people medals (see Figure 5.6) as well as fireworks when they complete all three rings with three different colours at the same time – the three rings refer to movement, exercise and standing (see Figure 5.5). Yang worked at the Apple Company and was proud of closing three rings and medals, which rarely happened for other participants who used the Apple Watch.

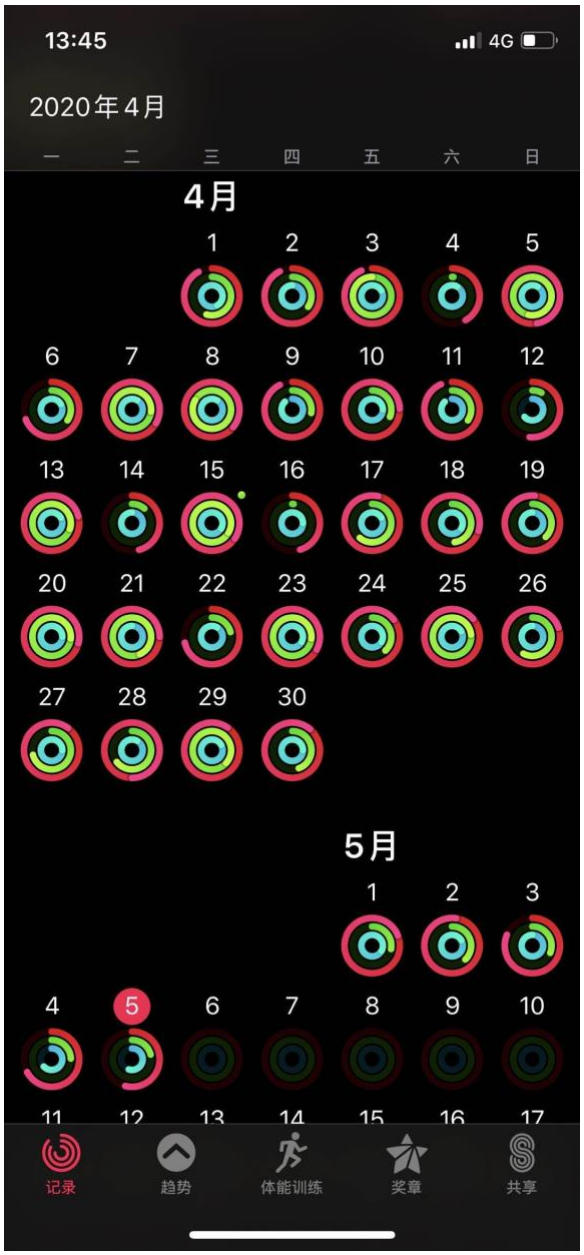


Figure 5.5: Screenshot of Yang's completion of closing three rings on the Apple Watch

Figure 5.6: Screenshot of Yang' rewards on the Apple Watch

In short, gamified self-tracking devices and apps provided entertainment, motivation and stress to self-trackers but also played an instrumental role in their daily lives. The gamified features made self-tracking practices more interesting and motivated self-trackers to participate in activities and pay close attention to their data. This potentially benefited people in achieving their self-tracking goals such as developing workout habits or living a healthy life. However, the majority of participants did not express as much enjoyment for gamification as strongly as Wen. For example, Zeyu was keen to win in the step competition but was mainly concerned with earning pocket money. Gamified motivation cannot inspire self-trackers for long. Many of them temporarily engaged with the gamified self-tracking but

then easily lost interest. Also, gamification brings pressure, requiring self-trackers to put in extra effort to achieve their goals. These examples show that what people received from the gamified self-tracking practices in return was unequal to the extra effort they made, although the participants did not mention the inequality. They also showed that participants had little agency around gamified self-tracking when rewards such as top ranking and money offered tiny benefits. They even disrupted their everyday and self-tracking routines to compete for these rewards. At the same time, people had some agency to resist the rewards when they noticed much more effort was needed for negligible results.

5.3.4 Using the features of self-tracking technologies in creative ways

Previous studies have suggested that people use self-tracking technologies in unexpected ways. For example, people used a step tracker to track cycling activities (Pink et al., 2018). While some features of specialised self-tracking apps were not commonly used by most self-trackers, several participants discovered these features for their self-monitoring. Fertility apps and running apps allow people to track various bodily conditions. For example, Zeyu, a first-year undergraduate student who has lived with a disease and has studied tropology. He learned himself about nutrition and eating healthily and was preparing for an exam to obtain a certificate called Chinese Health Manager. He learnt scientific information relevant to sleep, the human immune system and nutrition intake from food. Zeyu downloaded the Yodo Run app to track not only running aspects (food intake, steps) but also bodily conditions such as blood pressure, skin condition, and tongue. Although Zeyu only had one self-tracking app, he wanted to monitor as many things as he could in relation to his health following his experience of illness.

Another example involves tracking body temperature on fertility apps for different purposes. Wen heard that some of her friends recorded body temperature on the Meetyou app when they prepared for pregnancy, as a woman's body temperature could be higher around her period. Despite this, Wen never tracked her own temperature. However, Pang monitored her temperature on a fertility app, Clue, during the pandemic to determine whether she had caught COVID-19. She repurposed the app as an infection monitoring app:

> I was very sensitive as I travelled back home from Beijing to my hometown, and I might catch COVID… I never record this before. But this time the situation was unique, so I checked and recorded my body temperature on the app. I was a bit scared to record it. Back then… I can't be sure whether having a high body temperature was caused by a woman's period or by COVID-19. (Pang, 28, female, assistant lawyer, history of depression and cervical polyp operation, repeat interview)

Pang tracked her moods on a fertility app to avoid mental ill-health, as she had depression and anorexia. She lost control of her emotions while writing a dissertation for her master's degree in the UK. She recognised the signs of psychological depression and then looked for help from the University Psychological Consultancy in Mental Health Services. Since then,

she has begun to monitor her moods to prevent depression and now she only records this when she cannot account for her mood:

> Pang: I really care about my emotions. If I feel depressed or sad, or cry or cannot concentrate on things, I would consider the reason for having a bad mood. If I cannot find a reason, I would record it to see whether it is an abnormal situation. If I have an obvious reason for sadness, I won't record it.
>
> Interviewer: Will you look back on this to think about the reasons?
>
> Pang: So far, I didn't have serious problems. I imagine that if bad moods last for a long time, I would confirm whether I am in this bad situation recently. If it is, I would really pay attention to it. Also, when I was recording this, I also thought whether it was because of PMS, when it would be normal and fine to be sad for a while, or if it was not, I might consider seeing a doctor. (Pang, 28, female, assistant lawyer, history of depression and cervical polyp operation, repeat interview)

Another creative way of using self-tracking technologies involved the fitness videos on the Keep app. A few participants such as Yingyue and Pei worked out by following the fitness training videos created by the Keep app. However, Xiao was keen to explore new digital technologies and used a range of devices and apps for health monitoring. After following the training courses, he started to create a set of his own training movements to improve certain muscles.

This part discussed how people used secondary or tertiary functions of the technologies (sub-features) creatively, although only a few participants demonstrated their creative self-tracking capabilities. The features on a running mobile app were used by a participant for not only tracking steps but also tracking a range of health-related parameters. Some people ingeniously repurposed apps for self-tracking: creating a personal training course in the Keep app or using fertility apps to track moods, observe infection or schedule plans. The other important finding was that people did not use all the features of their devices, rather than selectively used one or several of them if they fit their purpose.

This section discussed how people used the same types of features in the self-tracking technologies that were popular on general devices and apps. It also discussed how people used the sub-functions of the technologies differently. From participants' narratives, it showed that people used self-tracking devices and apps in their own ways for individual needs and they tried to make good use of them to maintain good habits, achieve goals, live healthily and actively, have fun, earn rewards, and prevent ill-health. This demonstrates people's agency around the technologies—how they self-track, the apps and devices they use, whether they choose to use certain features, and how they use them.

5.4 Different Contexts

Given the picture of different uses of self-tracking devices and apps and their features in various personal mundane lives, this section will discuss changes in self-tracking practices over time. I will reference some examples of changes discussed in previous sections and will introduce some new data in relation to changes as additional differences such as seasonal variation. Chinese contexts will also be reference to highlight the differences in self-tracking practices discussed so far.

5.4.1 Changes in self-tracking practices

Discussion above has shown that sometimes participants changed what and how they self-tracked. The COVID-19 pandemic changed self-tracking routines. For example, during the lockdown Wen stopped tracking swimming as she had to stay indoors and the gym was closed; she then bought a Switch Ring to start to track her indoor exercise. Pang started to track her body temperature as she was worried about catching COVID-19. Xi stayed indoors and did not wear her Fitbit, barely producing any data. She started to track using pen and paper, which helped her monitor her daily life, such as yoga, water intake and food consumption. Otherwise, she felt that she did nothing and everyday was the same, which caused dissatisfaction and anxiety. After the lockdown and a move from Beijing to Shanghai, she started to rely on automatic tracking through the Apple Health app due to her busy work life.

The pandemic also changed the meaning of self-tracking data. As discussed earlier, many Chinese devices and apps can share physical exercise data such as running, cycling, walking data with WeChat and this can be presented as step data on WeRun. This caused increases in step data whenever people carried their mobile phones with them, even at home. A high step count was generally seen as a good sign of living healthily and being active, and participants made efforts to produce step data as much as they could. However, during the lockdown Chinese citizens were had to stay indoors. Producing high step data on WeRun could therefore be criticised by those in the networks on WeChat as it suggested they were not adhering to government guidance to stay inside. This changed how participants engaged with the technologies. During the COVID-19 pandemic, many interview participants (such as Xiaoyang and Tingting) said that they finally had time to focus on themselves by tracking exercises. After the lockdowns were eased, they tried hard to maintain their tracking routines to continue their good habits, though they found it hard to fit into their work routines. For example, Lele avoided using her mobile phone and Apple Watch:

> Lele: During the lockdown, I avoid increasing the number of steps because this seemed to show that I didn't stay at home and went outside a lot.
>
> Interviewer: How do you avoid this?

> Lele: I left my mobile phone by the bed. As I said earlier, during the spring festival, I did not even wear my watch. Although the Apple Watch cannot share my data to WeRun, the Apple Health app can. (Lele, 26, male, postgraduate student, initial interview)

Despite the overtime working culture, some participants tried hard to find opportunities to monitor their bodies and lives. For example, Pei started to track his running on days he did not work. Xinyue, a 40-year-old data operation developer who tracked running and heart rate on the JoyRun app, used to run for one hour in the morning three or four times each week during the pandemic, but since he went back to work in the office after lockdown, he changed the routine that he only tracked his running after work if he found the opportunity.

Changes in self-tracking practices also related to health situation, personal life, work life and other aspects of mundane routines. Changes mean not only tracking different things in different ways but also stopping self-tracking. As shown earlier, some participants started to self-track since they had been ill, although some of them struggled to continue monitoring once they recovered. For example, Jiankun lived with cancer and used to track runs and workouts on the Nike China app, the Adidas app and the Xiaomi Wristband to stay healthy. However, when his cancer came back and he lost 4kg, he could not exercise at all. Alternatively, he had to track steps on WeRun and aimed to get back to a somewhat fit life and began to pay more attention to his weight to put it back on. Additionally, participants changed their self-tracking routines along with their busy working patterns, and married life also changed what, when and how people tracked, as discussed earlier.

5.4.2 The Chinese context and differences in self-tracking data practices

Some of these differences and changes related to the Chinese context. The Chinese society and ordinary people's lives developed self-tracking culture in China, which can be different to self-tracking studies and culture in the West. There are examples of this in my analysis in how work was tightly linked to self-tracking practices. People started to track but could not continue because of China's work culture, particularly the 996 system, which is rarely found in other countries.

Other differences and changes that are specific to China relate to seasons including air quality, temperature, and seasonal activities. However, tracking activities that mainly focus on bodily parameters such as sleep, heart rate, weight, menstruation cycle, and mood are not seasonal. People track different things in different seasons in China, which is not necessarily the case elsewhere and methods of self-tracking can vary in each season. All participants lived in Beijing during the initial interviews and Beijing has four clear seasons. Air quality can be a big issue in winter so people prefer to exercise outside in other seasons, particularly in summer. For example, Xinyu was interviewed in March 2020 and he explained this in relation to his tracking running routines in winter:

> I planned to run on Monday, Wednesday and Friday. Well, there has been smog pollution in Beijing since Wednesday so I cannot run at all. I have to change my original plan and might run on Saturday but it means I cannot take my child to attend workshops. (Xinyue, 40, male, data operation developer, initial interview)

In another example, Hongbin, who was self-employed in the architecture industry, discussed the different physical activities and tracking he undertakes in different seasons, which started when he studied in the US:

> I engage with the types of activities that suit that season. When I studied in the US, I started to track skiing in winter and hiking in summer. When I came back to China, except for snow season, I usually tracked cycling on the road and workouts in the gym. (Hongbin, 31, male, self-employer, initial interview)

In Chin people usually exercise in the morning and in the evening when the weather is warm. This especially happens in northern China during the summer. In short, these seasonal changes sometimes changed methods of self-tracking, including stopping it. Cold weather can change self-tracking routines: for example, Lele stopped running in cold weather; Yan was keen to track cycling, but when he tracked depended on the weather.

Elements of the built environment affect when participants view their data and need different efforts to make sense of data. For example, Lele sometimes tracked low speed cycling for 2 hours in the evening, as he was unlikely to cycle at high speeds on city roads. Thus, it was unnecessary for him to view data such as heart rate. However, when he was able to cycle on a road with no traffic, he engaged with tracking for much longer and viewed cycling speeds and heart rate during and after the activity. During this time, a sensor that he set up in advance reminded him to slow down due to his high heart rate; he then continued tracking after a short break. He reviewed the data again afterwards. The living environment in Beijing can limit what and how to track. Houses are unaffordable for young people in Beijing and many participants lived in shared rental properties with small bedrooms. For example, Xiao's bedroom was fairly small so he could not buy a Switch to track workouts as it needed enough space to stretch and engage in exercise.

Another feature of the Chinese context relates to Chinese medical culture. This draws Chinese self-trackers' attention to specific self-tracking data and to have some understanding of self-tracking in relation to health and sub-health, which cannot be seen in Western self-tracking studies. The ideas of subhealth and sub-healthy conditions are familiar to Chinese people. Jiang and colleague (2021) note that the sub-healthy status refers to the human body being in a state between healthy and unhealthy, and that people have symptoms of decreased bodily functions, declined social adaptability, physical fatigue, or psychological depression, but these symptoms cannot yet be defined as diseases.

Even though the participants did not explicitly use the term subhealth to refer to their health issues, many said that they aimed to minimize the health risks by self-tracking, and the bodily situations that they described would be recognised by Chinese people as being associated with subhealth conditions. For example, as a teacher in a middle school Tingting noticed that

she had regular pain in her shoulder and neck, and she called it an occupational issue in the education field. Many other self-trackers such as Zeyu, Jiankun, Pei, and Yang commented that nowadays people who lived in cities had a range of bodily issues through playing with phones, having takeaways, and dealing with overwork. Participants described a range of symptoms or conditions that would be recognisable as sub-healthy such as mental problems like insomnia, neurasthenia, and depression. They aimed to sleep better by tracking their sleep patterns. The hot topic of staying up late has been given a lot of attention by the Chinese public – it is seen as a sign of subhealth that can cause diseases (Bunkenborg, 2014).

To improve subhealth, in the Chinese healthcare culture, people have a sense of keeping healthy. The concept of yangsheng (养生) – a Mandarin word referring to staying healthy and using preventive healthcare in everyday life – is a popular term in China (Sun, 2016). There are a range of approaches to yangsheng, which are well-known to the public, including many participants such as Tingting, Xi, Ying, Yiyi. For example, Xi described how she yangsheng:

> Xi: Before my period comes, one week earlier, I stop eating cold or warm food and reduce times of staying overtime. I found this very helpful, and I have less pain when my period comes. Probably only Chinese people do this, as some people say that the nature of mogo and dragon fruit is cold so eating them can help to bleed less during a period. Other people stop having spicy food, but I still do it.
>
> Interviewer: Do you think this kind of saying related to Chinese medicine?
>
> Xi: Yes. I think one reason is because of Chinese medicine. Second reason is… I am not sure about Western women, Chinese women get really super bad pain during periods. People in my social cycle prevent this cramp pain by doing these things. (Xi, 25, female, marking, history of depression and eating disorder, repeat interview)

Digital self-tracking is considered by many participants as a form of yangsheng and subhealth prevention. Working in the health industry, Cathy explained her understanding of subhealth, yangsheng and self-tracking:

> I think there are a range of subhealth conditions nowadays, including unhealthy lifestyles… I think we should prevent some chronic diseases such as diabetes in advance, as the living quality in the last 20 years of our lives are very important. Therefore, I start to yangsheng (养生)… Health conditions are significantly related to your lifestyles, as it is no doubt that some diseases you have relate to your current lifestyles… Nowadays, many chronic diseases are a type of metabolic disease. (Cathy, 32, female, self-employer, initial interview)

This section discussed how people change their self-tracking habits over time. Chinese contexts emerged in the changes and differences identified earlier in the chapter. The Chinese overtime work culture occupied self-trackers' time and interrupted their self-tracking routines. Also, seasons played a role in changing possibilities of self-tracking routines, particularly outdoor exercises. As some of participants could not exercise outside due to air pollution or cold weather, tracking practices had to be temporally interrupted. Living

conditions also limited several participants to track certain activities such as fitness training in small rental bedroom in Beijing. The other main variation in self-tracking practices was the Chinese medical culture, which provided an idea of tracking for subhealth management and prevention through the devices and apps. Self-tracking practices were combined with 'yangsheng' (养生) strategies to help some participants to live healthily.

5.5 Discussion and Conclusion

Overall, this chapter presented differences in self-tracking practices among users. The differences relate to people's personal daily lives, different experiences of using the technologies and features, changes over time, and the Chinese context. As summarised in Chapter Four, the differences in self-tracking practices related to the activities people track, the devices, apps and their features that people use, and the motivations for self-tracking. By combining the findings about the diverse uses of features of the technologies with various personal lives, the central argument of this chapter is that the different technologies, their features, and individual differences all impact differences in self-tracking practices, and they all intersect. These intersections are fluid and not settled.

The chapter has discussed how individuals' personal mundane lives lead to different ways of self-tracking. The diverse individual experiences of people in everyday life led to varied self-tracking practices. This relates to who they are, their everyday lives, their needs, and what they are tracking. Participants who lived in Chinese cities were often busy with work, and work routines were strongly related to what, how and when to track. Mundane life, including personal daily routines, family life and marriage, also informed how much attention people paid to self-tracking data and what their different self-tracking routines looked like previously and today. The chapter then addressed the various ways in which participants engaged with three common features of tracking devices (notification, goal setting and gamification). I found that the notification function was not always convenient for every self-tracker as it could be helpful for some people to easily view data from the homepage of mobile phones of apps, or annoying for others being distracted by receiving irrelevant information all the time. The finding suggested that people set up goals differently to have achievements from making real efforts to setting up new goals to adjust challenges. Also, some self-trackers used gamified features to earn rewards such as pocket money or high rankings of exercises-related data. Then, it observed how people used the same types of features of the self-tracking technologies differently and how they used certain features in creative ways. The last section focused on the changes in self-tracking practices and the role the Chinese context plays in self-tracking. Factors like seasons, environmental differences, and Chinese medical culture impact how Chinese people self-track differently from self-trackers in the West.

Understanding how self-tracking practices change illustrates that the intersection between technology, people and data is changeable and not settled. This is due to the face that self-tracking significantly relates to people's everyday lives, which are also changeable and unsettled. Rather than examining differences based on demographic characteristics such as

gender and age, this chapter focused on differences in interactions between features and individuals. On challenge in studying the differences in this chapter is that there are so many of them – different devices and apps; different activities in different personal lives – and they are all interrelated in a complex way and thus hard to separate. The approach in this chapter was to treat self-tracking broadly as an everyday practice rather than focusing on narrow areas of self-tracking. This chapter contributes to everyday self-tracking studies by illustrating the extent to which self-tracking is embedded in ordinary, everyday lives. The next two chapters focus on feelings and sharing and communicative practices, aiming to offer a balanced discussion on both differences and similarities/patterns.

Chapter 6 Feelings in Diverse Self-Tracking Data Practices

6.1 Introduction

As discussed in Chapter Four, self-trackers gathered data for various purposes, including health, lifestyle, and social reasons. These data were meaningful and valuable for many interview participants, as shown in Chapter Five. Many scholars (e.g., Kennedy et al., 2016; Lupton, 2017c) have highlighted the importance of data for people's decision-making and gaining knowledge. This chapter investigates how participants interpret these different practices and diverse data from the perspective of feelings and how they are incorporated into an understanding of the self, body, and mundane lives. This addresses the second research question concerning how people feel about their different digital self-tracking practices and data.

Research on feelings in self-tracking is important for understanding how people make sense of and use data and how they subjectively engage with self-tracking practices and data in Chinese society. This also matters when considering the complexity of interactions between self-tracking technologies, data, bodies, and feelings. I argue that self-tracking data shapes how people feel about their bodies and lifestyles, and feeling is a way of learning about bodies and lives through data and a way of interpretating the meanings of data.

It was established in Chapter Two that the concept of feelings is identified in this thesis as emotions, bodily sensations, and sensory responses. Emotions are understood as the feelings of the mind. Bodily sensation is used as a conceptual tool to explain the bodily responses of self-trackers. Sensory responses are explained as physical senses in this research in reference to physical feelings such as sight and touch. Researchers (Lupton et al., 2018; Pantzar et al., 2017; Pritz, 2016), working on senses and self-tracking data, use the term 'senses' to refer to embodied sensations. They suggest that self-trackers experience discrepancies and consistencies between their own sensemaking of their bodies and lives and the data.

I argue that emotions and bodily sensations are the ways in which people become voluntarily involved with interpretations of their self-tracking data and a way of knowing their bodies. A sensory response involves interactions with the devices and apps that self-trackers use. I found that people's feelings sometimes correspond with data but sometimes differ from what data tells people. Thus, this chapter links these feelings to understand the interconnections between four elements – body, the self, data, and technology – and to explore the discrepancies and consistencies that exist between them.

In the last five years, self-tracking scholars have started to pay attention to people's feelings about their data in everyday life. Research on people who engage with digital self-tracking practices and data has demonstrated that self-trackers respond emotionally to their tracking experiences and data (Ruckenstein, 2014; Sharon and Zandbergen, 2017; Weiner et al., 2020). However, these studies do not place feelings about data at the centre of their focus. Other researchers in self-tracking have focused on investigating feelings in self-tracking

practices. Lupton and her co-researchers (2018) found sensory feelings (from digital sensors built in to devices and apps), embodied sensations and emotions in digital cycling self-tracking data practices. Pink and Fors (2017a) observe self-trackers' sensory feelings about different environments (on steep and flat roads or on hard surfaces) and this type of feeling plays a role in understanding the relationships between physical activities, technologies, data, and environments. They suggest that these intersections shape people's means of self-tracking and involve a learning process about the body, technologies, and everyday lives.

However, little research has explored feelings across a range of digital self-tracking practices within the remit of a single study. Some scholars have only focused on one type of self-tracking, such as cycling (Lupton et al., 2018), heart rate (Pantzar and Ruckenstein, 2015), or the menstruation cycle (Hildebrandt et al., 2015). A few scholars have identified feelings about self-tracked fitness data such as running, cycling and walking (Kent, 2020b; Lomborg and Frandsen, 2016; Pink and Fors, 2017a). Feelings about body weight have also been observed by several researchers (Didžiokaitė et al., 2018a; Weiner et al., 2020), although researching feelings was not the focus of their studies. I address this omission in the research by investigating feelings across diverse self-tracking types.

As seen in Chapter Two and above, most existing research has focused on either emotional or sensory responses to self-tracking practices and data. Work by Lupton and colleagues (2018), which discusses emotions, sensory feelings and bodily sensations, is an exception. Also, few studies have considered feelings about various types of self-tracking practices and data in terms of emotions, bodily sensations and physical senses in combination. This study found that sometimes these emotional, body and mind elements emerge simultaneously when making sense of data, the self and bodies. These feelings can vary based on different types of data and different contexts. Therefore, I mobilise understandings of the term feelings, as emotions, as bodily sensations, and as physical senses. In doing so, I contribute to existing scholarship.

The term 'feelings' in this study, therefore, includes emotional and bodily responses and sensory feelings. For simplicity, I present these feelings about types of self-tracking data separately, even though – as seen in the last two chapters – some people engaged with more than one type of data. I emphasise that the four elements listed above are intertwined, working together to contribute to the understanding of how people interpret and use their data.

This chapter will discuss diverse types of self-tracking (and related data and data visualisations) that interview participants and Weibo users expressed feelings about. The most common feelings relate to weight. It is also common when people talk about their feelings about weight that they mention data in relation to calories and food consumption. This can be explained by the discussion in Chapter Four in that weight is often tracked with calories and food consumption together. Discussion then moves to feelings about the menstruation cycle. The chapter finally focuses on feeling about heart rate and physical exercise. I argue that participants had stronger feelings about weight-related and menstruation cycle data, less strong feelings about heart rate and sleep data, and few feelings about

physical exercise data. The variety of such feelings could be triggered by data and data visualisations, personal bodily conditions, self-tracking needs, technologies, and cultural contexts. These variations emerge in relevant types of tracking. I also argue that emotions, bodily sensations, physical senses, data, and data visualisations are intertwined in self-tracking experiences.

6.2 Feelings About Weight, Calories, and Food Consumption

This section explores how feelings help self-trackers make sense of their data, understand internal bodily conditions, and adjust their daily lives. I found that feelings about weight-related data and its data visualisations are associated with ways of measuring, viewing, and reviewing the data. Also, feelings often draw people's attention to their mundane habits, such as eating and exercise routines. As discussed in Chapter Four, calories and food consumption are sometimes tracked along with weight. Interview participants in this study expressed much stronger feelings about weight compared to calories and food consumption. Therefore, this section focuses on feelings about weight, only briefly discussing feelings in relation to the two other aspects at the end of the section.

6.2.1 Tracking and viewing weight data

Most interview participants expressed an overwhelming fear of gaining weight. While some were overweight, others had their own perceptions of what the ideal weight should be. On the other hand, several participants (such as Ying and Jiankun) were anxious about losing weight due to personal health issues such as cancer. I found that interpretations of the relationship between feelings, the body, and data and data visualisations involved the process of self-awareness and making decisions about how to live a life and how to take care of the self.

Most participants who tracked weight set their own standards for maximum weight. They often felt anxious, afraid, worried, and sad when their weight approached their maximum limit. To avoid these negative feelings and gain good feelings about the self, the interview participants made decisions about whether and when to weigh themselves. Those who aimed to lose weight preferred to go on the scales when their weight was the lightest, such as in the morning. For example, Wen started to track her weight in the mornings after her initial interview, when she realised her weight exceeded her preferred benchmark of less than 50 kilograms:

> It is ridiculous, you know! Two years ago, my weight was under 50 kilograms. Last year it increased to be over 50 kilograms that I put about 10 kilograms weight on, which I could not accept at all. In this process of increasing weight, I clearly knew I was getting fatter and fatter, but I could not accept this fact, but I did not want to exercise. I felt hopeless. So I stopped tracking my weight. But later when I made a serious decision that I should face my weight and lose some, I started to track it again. I

> think I am lightest in the morning, so I track it every morning. I felt motivated whenever I went on the scale in the morning. Also, I remembered each recording in my mind instead of storing it in the app and have a comparison of data recorded every morning to see the changes. This way data is meaningful by measuring it at the same time each day. (Wen, 28, female, primary school teacher, repeat interview)

This suggests that measuring weight in the morning makes self-trackers feel good about their data. Similarly, Xi was obsessive about tracking her weight for several reasons, such as the pressure from her mother's habit of judging her since she was 13 years old, concerns about gaining weight in future pregnancies, and health concerns. She rarely felt satisfied with her weight and felt unhappy and anxious when her weight was over 54 kilograms. Despite this, she felt happy when monitoring her weight in the morning:

> In terms of tracking weight, mostly I have negative emotions. I notice that the heavier I am, the less interest I have in measuring my weight and looking at the data. When I become lighter, I even measure it twice each day – once in the morning and once in the evening. I would like to see if I am thinner or not. Anyway, I prefer to look at positive things and avoid negative things. (Xi, 25, female, marketing officer, history of depression and eating disorder, initial interview)

Participants such as Wen and Xi tracked their weight, and viewed data as a form of self-surveillance. When weight data increased to an unacceptable level or they did not meet their weight loss goals, they often refrained from tracking and viewing the data. Esmonde (2020) explains that women's concerns about weight loss are tied to representation of self-discipline and the idea of being both healthy and beautiful. My finding challenges Lu and colleagues (2021a) finding in their human-centred computing study comparing Chinese and Western food tracking apps that Chinese females feel stressed about weighing over 50kg, due to the Chinese cultural beauty norm that pursues the idea of thinness. They note a well-known Chinese saying that "beautiful girls shall never weigh over 50kg" (好女不过百) (Lu et al., 2021a, p.7); their participants aimed to reach weight goals of under 50kg by tracking relevant parameters. In contrast to their participants, every interview participant in this study set their own weight goal that suited their individual needs rather than following the cultural norm.

Additionally, as a participant commented in Lu and colleagues' study (2021a), women were never satisfied with their weight and never thought they were thin enough and the participant thought she would be more beautiful under 50kg. Like many of my interview participants, they often felt worried and anxious if they thought they might have gained weight, although there were not overweight. These feelings led them to avoid tracking their weight. This reinforces the results of previous studies (Didžiokaitė et al., 2018b; Lupton et al., 2018) which showed that self-trackers might ignore their data to avoid the anxiety caused by looking at it. For example, Cathy said, "I am very afraid of going on the scale because I ate too much in the past few days" (32, female, self-employed, initial interview). Participants often experienced positive feelings when tracking weight data, which were crucial for maintaining their self-surveillance and regular weight monitoring. If they assumed that they might become heavier, they were likely to refrain from tracking. This approach to managing

weight tracking and emotions often happened casually in everyday life, but was different from self-tracking intended for serious weight loss.

Many participants (including Wen, Xinyue and Xi) decided to take their weight loss seriously, once they started to track their weight. In these instances, weight data become meaningful to represent people's weight changes over time and their efforts towards their goals. While the participants acknowledged potential anxieties and worries, they felt happy, proud and relieved about their weight-tracking practices. For example, during the COVID-19 pandemic, Xinyue occasionally tracked his weight and observed a gradual increase, though it was not significant. When it reached 71 kilograms, he started to have a sense of crisis, felt a little worried about gaining weight, and then felt proud of his successful progress in weight loss afterwards by tracking his weight every morning:

> I was a bit worried that if I didn't start to control it my body's physical ability would decrease a lot and my weight would continue growing. Since then, I started to run, ate less food, and had a better diet, like less oil, salt and sugar than before. So my weight went down quickly. I lost about 5 kilograms within two months! (Xinyue, 40, male, IT engineer, repeat interview)

Based on my field notes, his tone and his smile showed that he felt proud of his progress of weight loss and less worried about being overweight. Adopting healthy eating and exercising habits, combined with the good process of weight loss through tracking triggered his self-pride and released his worries about being overweight. This is consistent with Kent's (2020a) argument that regularly self-tracking over time provokes anxiety, yet it also represents people's self-discipline through exercise, dietary habits, and other lifestyle choices. Feeling elation and self-control are seen as part of making efforts toward healthy behaviour (Kent, 2020a). Additionally, negative feelings about gaining weight such as stress and anxiety are not always a bad thing. Rather, when weight becomes an important tracking metric, feelings play a role in self-encouragement towards goal achievement (weight loss, body shape improvement and health management) and increasing activeness in tracking weight and weight-related data practices.

In contrast to those tracking weight loss, interview participants aimed to gain weight measured their weight in the evening. For example, Ying attempted to put weight on by monitoring her daily weight; she felt confused about losing weight and felt relieved when her weight went back to normal:

> I am quite thin. By tracking my weight, I attempted to see if I should eat a bit more over a particular period. I often go on the scale before I go to bed. During the pandemic, my weight significantly decreased. My first reactions were whether I treated myself badly and whether I took in less nutrition and oil than before. I feel confused about why my weight went down again… After a while when my weight went back to my original normal weight standard, I felt relatively relieved. (Ying, 25, female, Internet employee, initial interview)

Although Ying did not mention her reason for monitoring her weight after dinner, my interpretation was that the data could possibly show a heavier weight in the evening compared to earlier in the day. This likely made her feel good about her weight data. The accounts of participants above are indicative of the relationships between weight data, emotions, and the self in which emotions are evoked by the data and draw self-trackers' attention to reflection on weight management. In this sense, emotions about weight data suggest individuals' reflexive self-awareness about their bodies (such as weight changes) and underline the embedded nature of self-tracking into everyday lives (Didžiokaitė et al., 2018a; Lupton and Smith, 2018).

Interview participants had their own weight standards, which differed from those of others. No matter when participants decided to measure their weight or whether they attempted to lose or gain it, they had the same purpose: producing data they wanted to see. As Didžiokaitė and others (2018a) point out, people selectively monitor and view data which could make them feel better about themselves and the feeling of success motivates people to continue tracking. Also, tracking weight and seeing the data can often triggered anxieties about weight, body, and health conditions when the data does not meet their weight standards. To deal with the anxiety of seeing unsatisfactory data, people sometimes refuse to track weight. It is unnecessary to view this type of data, as it indicates days when tracking was unsuccessful (Didžiokaitė et al., 2018a). However, when people take their weight seriously, regularly seeing weight data can help them deal with negative emotions such as feelings of anxiety and failure. They choose the right time to track their weight to relieve anxiety and feel good about themselves. Tracking weight in the morning could produce the lightest weight during the day, which could cheer up those who aimed to lose weight. Tracking weight in the late evening could produce the heaviest weight during the day, so participants who aimed to increase weight felt satisfied and relieved. Thus, the examples provided imply the role emotions play in deciding whether and when to track and view data, as well as judging progress towards goals.

6.2.2 Reviewing and comparing data and data visualisations

Weight data includes not only numbers but also relevant analytical statistics or reports, often visualised as line charts and sometimes represented in other visual formats such as histograms or circles. Most interview participants compared their current data with their historical data to reflect on their weight changes and justify achievements such as losing or gaining weight.

Reviewing weight numbers is one way to reflect on weight changes. By seeing the weight number each time, some participants could compare them mentally to track the changes. Seeing numbers about weight changes beyond the participants' expectations can trigger feelings of anxiety about weight, body shape and general state of their health. For example, during the pandemic, Xi had no opportunity to work out in the gym to lose weight, and she lost control of her goal to eat less food, although at the same time she tried to manage her

weight. She compared her daily weight data from different days and saw numbers suggesting her weight was increasing. This made her scared of becoming ill and she worried her body might get worse along with her general health. Her worries and anxiety drove her to improve self-management, tracking her progress with a notebook, her Fitbit watch, and its bespoke app. When her weight was higher than her self-identified standard of 55 kilograms, she panicked. After the COVID-19 lockdowns, Xi was shocked to see that her weight was 57.5 kilograms:

> Since I moved to a new flat in Shanghai from Beijing last week, I didn't buy a scale and I didn't pay attention to my weight. When I weighed myself in the gym, I suddenly realized that my weight was seriously exceeding my original standard from 55 kilograms to 57.5 kilograms. Then I felt very surprised and became anxious, but I didn't feel that my pants became tighter or any other changes. Then I arranged to do some exercises like dancing at home at night. That is, more than 55 kg will affect me, vice versa. Even though I knew the scale in the gym was inaccurate, I still couldn't accept my weight. I never allow any scale to weigh me over 55 kilograms. (Xi, 25, female, marketing officer, history of depression and eating disorder, repeat interview)

Seeing these weight statistics stirred emotions, increasing awareness of weight changes and motivating engagement with further weight tracking. As shown by this example, weight gain was considered as a potential cause of weight-related diseases. This reflects how weight numbers and emotions about obvious numeric changes are linked to thoughts about potential health conditions. People track weight and other relevant metrics (such as food intake and calories) to maintain a healthy weight (Esmonde, 2020) and to improve well-being and healthy lifestyles (Kent, 2020a; Niva, 2017).

Bodily feelings related to clothing played a role in weight tracking practices, though sometimes these feelings were inconsistent with weight statistics. The interactions between feelings, weight data and minds worked together to contribute to knowledge about weight and to making decisions about weight management. For example, Xi and other participants such as Wen and Pang sometimes guessed whether they had put weight on or not by feeling whether their clothes had become tighter. According to Xi's above description, she trusted the information that weight numbers provided, even though wearing the same trousers felt the same as usual. This demonstrates that weight numeric data are seen as more trustworthy for interpreting weight conditions than sensory feelings. In contrast, Pang, who tracked weight for weight loss reasons, relied on the senses as "experiential embodied knowledge" (Lupton et al., 2018) which refers to previous bodily experiences to justify her body weight. She recalled that avoiding tracking her weight as she was busy with law examinations and could not spare time for self-tracking. She reflected how she knew that she had become fatter than before by wearing trousers without tracking weight:

> I felt extremely annoyed and uncomfortable when I could not put my trouser zipper up at all. It was caused by putting much more weight on than in the past. (Pang, 28, female, assistant lawyer, history of depression and cervical polyp operation, initial interview)

Two examples suggest a battle between the sensation of feeling fatness through clothes and actual weight data. This speaks to Esmonde's (2020) findings that people rely on sensory feelings about body weight through their clothes over weight data. I argue that ways individuals reconcile discrepancies between data and sensations indicate different levels of trust in their feelings and weight statistics. These cases also show either data or the uncomfortable feelings of tight clothes can trigger self-trackers' negative emotions about weight, leading to an increased body awareness.

Visualising weight changes in a line chart or a histogram was valued by most interview participants who tracked their weight, as they believed visualised weight to be more accurate and factual than raw statistics. They felt happy, relieved, worried, disappointed, depressed and self-doubt when seeing the changes in line charts. For example, Xi explained how happy she was whenever she saw the range of positive weight changes in the line chart:

> I often weigh myself with three scales in the gym, at home and at a friend's apartment. I don't feel happy when I see lighter weight using my friend's scale because I don't think the scale is accurate. Rather I pay attention to the float data and the comparison between data history, which is more accurate than weight data themselves. (Xi, 25, female, marketing officer, history of depression and eating disorder, repeat interview)

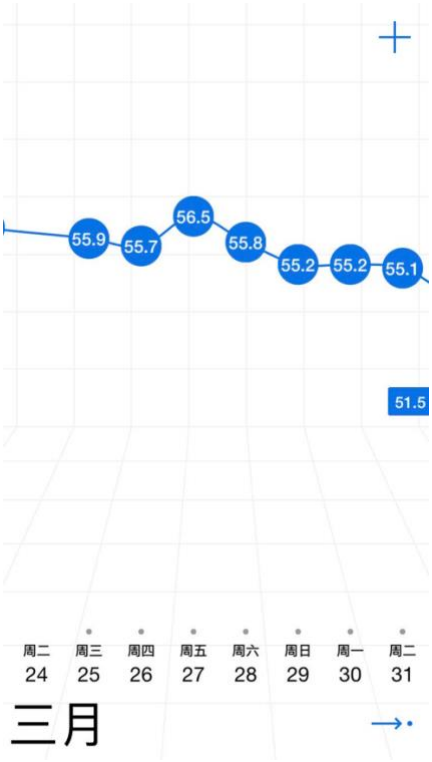


Figure 6.1: Xi's daily weight recording from 24 to 31 March on the Weight Loss Journey app

However, Jiankun felt sadness and depression when he saw a dramatic weight decrease in the histogram graph which was indivative of his cancer's return. He did not show a screenshot of weight loss in the interview but described his feeling about seeing the visualised weight data that were produced by the Mi smart scale and represented on the Mi Fit app:

> I lost 4kg weight due to my disease. My body was also dehydrated. I couldn't do anything about it. So I had to recuperate and couldn't exercise. Everything must be started from the beginning. During the last 20 years, I got used to being ill. It was normal to me. I tracked my weight every day and surely felt a bit depressed during that period when the graph intuitively showed me the trend of increasingly losing weight. (Jiankun, 37, male, energy company employee, cancer, initial interview)

Data visualisations were understood by most participants who paid attention to visualised weight changes as providing factual information about body weight so they subsequently changed their self-tracking routines and adjusted other habits if needed. For example, Jiankun rarely had feelings about his weight when he tracked his weight once a week as his weight change ranged from 0.5 to 1kg each month. However, the visualisation of losing weight in the histogram evoked an emotional response, which led to him changing his habits and tracking his weight every day. Thus, data visualisations about weight changes could evoke self-trackers' feelings about data and create knowledge about their bodies, leading to further practical adjustments. This finding speaks to Ruckenstein's (2014) point that self-trackers consider data visualisations as providing factual insights and their responses to the data represents in their emotions a mundane permanence such as changing previous work schedules to improve the issue represented in the curves of a graph.

The different ways in which visual formats represented weight also triggered self-trackers' different emotions about data. The same data can be represented differently in relation to daily, weekly and monthly weights. For example, in their weekly weight recording, Xi felt that line charts as shown in Figure 6.1 provided a sense of space, giving her a feeling that her weight was going down, and that her weight loss goal of 51.5 kg seemed to be a long way off being achieved. This helped maintain her motivation to continue tracking and losing weight.

Additionally, line charts represent the same data in different ways due to messy data input, which can trigger confusion, disappointment and annoyance. 'Messy data' occurs when people do not easily recognise their data, gain useful information from them, and regard them as inaccurate data. In terms of tracking weight, self-trackers' personal data sometimes got messed up through the existence of others' data in the same account such as their partner's or even their pet's weight. For example, Yiyi explained that her weight tracker stored weight data from herself, her boyfriend, and her pet rabbit. As shown in Figure 6.3, her boyfriend entered his own weight into her account on the weight tracker and she also regularly carried her rabbit to measure its weight. This corrupted her scale and made her feel it was difficult to interpret her own weight data – she called the data 'dirty' and 'messy'. When her weight went fluctuated, it only made tiny changes on the chart because the scale was corrupted. Yiyi explained her different feelings and reaction to two line charts (Figures 6.2 and 6.3):

> When I saw Figure 6 [in the material document during the interview] in the last two days, I felt a little bit nervous and very anxious. I found that this curve rose dramatically and there is a peak. I feel like I got so much fatter. I was having a bit of pressure. My first reaction would be, hey, how come there is such a peak value, and then I would look at it again, oh it is okay, that is only 48.4 kg. Basically, I controlled

my weight pretty good. Then I take a close look at it, and I realise that it is actually only one gram difference. Figure 5 shows you a bug, because my boyfriend stood on my weight scale once, so his weight 76.8kg was recorded in this graph and I couldn't delete it or something, which resulted in the record of 76.8 being kept on it. There is always a peak at 76.8kg. Like Figure 5 shows me in such a stable state, and I feel that I haven't become fatter, nor thinner either. And this 46.3 is very deceptive and lying. That is, your weight seems to be floating around 46.3, but you know because of the above 76.8 which is very annoying, because my weight is actually nearly 50kg, but it looks like only above 46.3 a tiny bit. So I can't tell my weight changes and I can't feel any pressure. Until I see the Figure 6 my weight goes straight to a peak, I immediately feel so nervous that I notice recently my weight went high. Although I know the data actually means only one kilogram change, but the chart gives you pressure visually. (Yiyi, 29, female, Internet operations planning officer, initial interview)

Figure 6.2: Yiyi's screenshot of weight-related data (Figure 6 in my material document)

Figure 6.3: Yiyi's screenshot of weight-related data (Figure 5 in my material document)

These examples show that different visualisations evoke different feelings about weight data. Weight shown in Figure 6.3 is seen as meaningless and disappointing data, because Yiyi liked to see bigger changes to motivate her to lose more weight. Anxious emotion about the line going up is not always a bad thing for participants like Yiyi, as it inspires self-trackers to continue losing weight and benefits their self-control for weight management.

> I think that the number may be shocking to me more than my boyfriend's reminder. When you see that data is rising, it has better effects on weight loss, workout and becoming healthy than when he tells you what to do every day. (Yiyi, 29, female, Internet operations planning officer, initial interview)

Reviewing their history of data and data visualisations evoked feelings about their current weight, which led many participants to adjust their daily lifestyles, especially their eating habits. Many interview participants (like Yiyi, Ying, Wen, Yang) had feelings of satisfaction

as monitoring their weight gave them good excuses and freedom to eat any food without guilt. Ying felt relieved when her weight lines went up and became stable, as she aimed to put weight on. Otherwise, she said that she would make efforts to eat more food to increase her weight. However, when their weight went up, many interview participants felt anxious. The anxiety was not a bad thing, as they were motivated by the feeling to maintain better lifestyles again. For instance, Yiyi tracked her weight and never let it rise to 50kg, and she asked her boyfriend to help monitor her weight together. She described what changes she made after seeing her weight go over 50kg and how she felt about this:

> I freaked out immediately when I saw my weight was 50kg [Figure 6.2]. I can't accept my weight number is three digits. During that time, I crazily stopped eating carbs and exercised crazily until it dropped back to 46kg. Now I can show you a screenshot of my data, here you can see that my weight went back to 47kg again that time. [But] I am going to take a dancing class again for three days in a row, because I become anxious and put weight on again. For me, viewing data plays a role of self-surveillance. Once I realise my weight has a trend to get very close to 50kg, I become extremely strict to myself and lose my mind and lose weight frantically. Of course, I am also relaxed about my weight sometimes. For example, when I went on the scale that showed 45kg and the last record as 44.7kg, I start to eat anything I want. I feel relieved that I can relax for a while. (Yiyi, 29, female, Internet operations planning officer, initial interview)

So far, I have shown how data may elicit emotions. I now move on to discuss how data is linked to feelings in a different way when used to explain bodily sensations. Bodily sensations could tell self-trackers how to track their weight and what changes they should make. A few interview participants had bodily feelings that when they lost weight, their body had corresponding feelings. For example, Pang felt her body become more flexible, lighter, and fresher after losing some weight. Before weight loss, she felt extremely uncomfortable whenever she put on clothes and struggled to zip up her trousers. Several interview participants felt satisfied and happy about their weight data and their better bodily feelings after weight loss. For instance, Yiyi noticed a 3kg reduction in her weight, which she linked to her feeling lighter and more flexible than before. This sensation made her feel happy and relieved.

By contrast, since Xinyue lost weight, he said that he has felt a change in his body and a decrease in his physical ability while running. His body felt tired when running, therefore, he made changes to his diet:

> Recently I worked overtime for a few days and lost weight, I feel like my physical ability is decreasing a lot when I am running. I can feel my body situation is not as good as before. This is not what I wanted it. I assume that I might lose too much weight or not eat enough food. So I adjusted my daily diet and running techniques. (Xinyue, 40, male, IT engineer, repeat interview)

Moreover, as calories and food consumption are often tracked with weight or other metrics (like exercise) together, feelings about both metrics sometimes emerge. This can explain the

information in Table 4.3 regarding why three participants previously tracked calories and food consumption on the Mint Health app but discontinued doing so before participating in this project. Yang explained her negative feelings about tracking two types of metrics on the app:

> Monitoring diet like food and calories that each food contains always tells me I overeat again, which gives me negative information all the time. If I could track how much I burned, I am happy to see it. I am not brave enough. I want to avoid seeing the negative information and don't want to face myself, because I am aware of my shortcomings such as being overweight and eating too much dessert. Life is already very painful, so I feel extremely scared and anxious to track this. (Yang, 36, female, Internet employee, cervical pain and low heart rate, initial interview)

Most participants expressed a lack of feelings about tracking calories and food consumption due to certain reasons. Sometimes, devices and apps trigger emotions that go beyond the data they provide. Some participants, like Xiaoyang, never cared about tracking the metrics and indulged in their diet, believing that eating normally without obsessing over counting calories was acceptable as long as they could avoid eating too much or having food with high calories. This ignoration of tracking calories, weight and food can be also noted in the Esmonde's (2020) study that people feel entitled to pay no attention to calorie-counting and food consumption as they already live with healthy lifestyles such as exercises and eating healthily. People express hopes to feel free to eat without any worries about calories and weight-related issues and additional effort for losing weight (Niva, 2017). Also, data analytics is seen as a 'black box' that confuses many participants (e.g Wen, Xiaoyang and Yang) about calculating calories in this study. The feeling of confusion is about analytic algorithms. That is, people's feelings about calories and food consumption is not as strong as weight data.

This section discussed how self-trackers chose the best times of day to measure their weight to achieve positive emotions about tracking goals. People sometimes refused to track their weight to avoid anxiety and disappointment at failing to reach their goals, including losing and gaining weight. However, once they committed to tracking their weight seriously, they could handle any resulting anxiety. Also, the interplay between feelings and data led self-trackers to make changes to relevant behaviours to meet their expectations. When the information provided by data failed to meet people's expectations, data triggered people's feelings such as getting upset, sadness, surprise, and worry. Feelings about weight emerged through comparisons of data. By comparing weight data history (through numbers, analytic data, and line charts), self-trackers adjusted their lifestyles either by ignoring good diets and weight trackers or developing good lifestyles. They had a short break from tracking their weight allowed some to feel relief and happiness, while others continually tracked their weight to maintain good lifestyles and body states. Different forms of representation of data brought different feelings to self-trackers, and self-trackers chose a favourite visual style to observe their weight data. Furthermore, weight data was associated with embodied feelings such as feeling relaxed, lighter and more comfortable, or feeling tired after weight loss.

6.3 Feelings About Menstruation Cycle-Related Data

As discussed above, people had strong feelings about their weight and fewer feelings about calories and food consumption. Tracking the menstruation cycle was another activity that strongly involved female self-trackers' emotions and bodily feelings. Such feelings reminded female self-trackers to pay attention to recording relevant data, reviewing their data to predict and judge their next menstruation cycle, being aware of potential illnesses, and gaining knowledge about their bodies and health.

Bodily sensations and emotions played a role in motivating people to actively engage with tracking their menstruation cycles. When these feelings disappeared at the end of their period, self-trackers became more relaxed with this tracking activity and sometimes even forgot about it. Many female participants, such as Pang, Wen, Xi, and Xiaoyang, immediately recorded their bodily states in relation to their menstruation cycles in the first few days of their period, when their bodies felt abnormal, uncomfortable, accompanied with feelings of pain and tiredness. They often forgot or deliberately stopped recording the things they usually paid close attention to as their feelings in relation to the period disappeared. For example, Xiaoyang described how her body suddenly clearly felt different to usual, such as experiencing pain in her breasts and a headache, compared to the time before or when her period came. She decided to record these feelings and usually tracked them for two days at the beginning of her menstruation cycle. She never tracked things on the period tracker app after her period ended, as her "body felt relatively light after that…" and "the body has more issues and more feelings for a few days before the period comes" (Xiaoyang, 32, female, journal editor, family history of heart disease, initial interview). A social media user named Golden Girl described how she knew when her period would come and confirmed this feeling by viewing prediction data on a menstruation tracker:

> Feeling about periods is always very accurate. Today when I get up, I have the feeling like I seem to have a cold and feel dizzy. So I check with the tracker app that shows my period will come in about 2 days. Later, when I brush teeth, my period comes. My feeling is extremely accurate. (Weibo user, Golden Girl)

Pang recorded more detailed information than other female interview participants on a fertility tracker called Clue, including her emotions, moods, bodily sensations, and symptoms over the course of several years. She explained her confusion about abnormal pain in her stomach and abdomen, which made her immediately record this situation; sometimes such feelings did not relate to her period:

> One day I had bleeding down there and abdominal cramps. I usually have stomach pain so the feeling on that day was very similar with premenstrual phrase. Next day I was bleeding as well. So I immediately viewed the data on the app to see which stage of the menstruation cycle I was at, but it showed that my next period would not come just yet and I was at the ovulation time. I recorded the bleeding and painful feelings by the way

> because these feelings were very similar with when my period came. (Pang, 28, female, assistant lawyer, history of depression and cervical polyp operation, initial interview)

This showed that feelings related to periods reminded people of tracking and encouraged them to look at previous data records. As each self-tracker was familiar with their own regular symptoms, they learned about their bodies and menstruation cycles through feelings and recording of bodily states. Similar feelings about menstruation cycles also motivated people to record their feelings and draw attention to the period data history. The feelings were used to judge not only period time but also potential illness (Grenfell et al., 2021). These bodily and emotional feelings warned people to engage with self-tracking, in terms of recording bodily sensations and analysing patterns. Even though bodily sensations provided people with general ideas about bodily states, data makes bodily feelings more understandable and body states more visible.

Recording bodily feelings with body states helped with long-term self-observation and the progress of self-learning of bodies. By thinking about bodily feelings and recorded data along with their daily lives and experiences, people became familiar with their bodies (Algera, 2022; Lupton, 2017c) and could make assumptions about their bodies when feelings appeared in the future. Observing and learning about bodies requires a lot of people's attention, time and effort. Despite these efforts, sometimes participants struggled with understanding these phenomena. For example, Pang carefully analysed her bodily sensations and data to learn about her body, but she sometimes still felt worried and confused about her bodily situations. Thus, she made extra efforts to understand why her period came late:

> This time I completely had no idea why my period was delayed. I was super worried like whether I had some cervical lesions, or I was pregnant. [Laughs] I recorded symptoms that I had and reviewed and analysed more previous data. Eventually I believed that the reason was caused by stress during the holiday, as I had to take care of my dad in Thailand, and I was worried we might have some accident in a foreign country. I had some rough memories since one decade ago that whenever I was stressed with examinations and other things, my period was always delayed. These are only memories. But by comparing these previous data on the app, I found that the times that my periods were delayed in the past all happened when I had my examinations. This made me believe that this time I was even more stressed than before. (Pang, 28, female, assistant lawyer, history of depression and cervical polyp operation, repeat interview)

Although bodily sensations and data do not always tell people the information they expect, they provide possibilities for people to access assumptions about their bodies. For example, Xi repeatedly viewed the dates of her menstruation cycle on the PinkBird app whenever her feelings changed, and her partner also kept her changes in mind:

> I intuitively attribute some of changes in my mood, emotions and health to my menstruation cycle. So whenever these feelings and changes appear, my partner and I start to wonder whether they are caused by my period. He suggested that I should check

> it with the app. If we did not find any clue, I don't think further why I have weird feelings like this. If we find my period is the reason, we feel reassured. Oh yeah, I see, it is exactly as we thought. So yeah, we have this kind of feeling. (Xi, 25, female, marketing officer, history of depression and eating disorder, initial interview)

It was not always easy to explain the feelings, period conditions, and bodily states. Struggles with explaining these often triggered negative emotions. In short, bodily and emotional feelings are treated as important signs to judge body status. Feelings make females more sensitive about their bodies, and recording data was a useful way to let them remember bodily sensations (Lupton et al., 2018). Observation of bodily sensations in everyday life is a process of knowing bodies and learning correlations between bodily sensations, bodies, emotions, data and daily lifestyles. Self-trackers usually record bodily sensations and view the relevant data for some time to observe regular changes in bodily sensations and moods. Based on these regular representations of feelings, some changes in body and emotion become acceptable. This forms a loop in which bodily feelings motivate people to record bodies and view data using technology, and in turn the data is evidence that can explain abnormal feelings and changes in body states.

Additionally, females experienced indescribable changes inside their bodies when their periods were due, and they learnt about body patterns during menstruation cycle periods through their feelings and data. Four female participants gained the knowledge that their body temperature increased before menstruation by watching TV programmes and through doctors' social media accounts. None of them monitored their body temperature, except for Pang. Those who never tracked body temperature noted that they only had knowledge about general changes relating to body temperature in relation to pregnancy and menstruation but had no idea about their own bodies. In contrast, Pang sometimes measured her body temperatures and recorded it on the Clue app, thus she knew "it went higher before the period came" (Pang, 28, female, assistant lawyer, history of depression and cervical polyp operation, initial interview).

Also, many female participants, such as Xi, Pang, and Wen, and their partners knew that women had bad moods and felt emotional, such as feeling unhappy, sad, or angry when experiencing premenstrual syndrome (PMS), by recording period dates and relevant symptoms and observing their bodily and emotions around that time. Many participants noticed that they usually put some weight on before their periods after long-term observations of their bodies, and they felt hungry during their period. This type of knowledge was learned from bodily sensations and observation of their bodies (Karlsson, 2019). Self-trackers are familiar with this type of bodily sensations, which can make them feel relieved and calm about the failure to track weight when they notice they are heavier around menstruation.

The other common knowledge that many participants learned from data and feelings was that stress and anxiety in the body and emotions could delay when their period came, as already exemplified in the excerpt from Pang above. Lupton (2015) points that health information on period apps indicates there is an association between "feeling high levels of stress" (p.445) and periods. Recording these feelings strengthened people's knowledge and beliefs about

these body-related patterns between feelings, body, data and daily experiences. Knowing these patterns increased participants' awareness of their changing habits and their consequences.

Figure 6.4: Pang's screenshot of menstruation cycle presented in a circle pattern

As seen in Figure 6.4, circles represent the various stages of the menstruation cycle, including menstruation, ovulation, fertile days, and premenstrual syndrome (PMS). For example, Pang took pleasure in looking at the circle pattern (Figure 6.4) which clearly showed her menstruation cycle. Her satisfaction with the data presentation through the circle pattern encouraged her continue use of the app to monitor her body for years as it was an easy and convenient way to view data. In short, bodily feelings led to her monitoring her resting heart rate.

Therefore, feelings about self-tracking menstruation cycles differed slightly from those evoked by weight tracking. Weight tracking triggered more emotions, although bodily sensations and sensory feelings were treated as supplementary evidence to understand whether people became thinner or fatter. Differently, periods tracking was closely related to bodily sensations and emotions. In this context, feelings carry practical meanings for period

prediction, self-knowledge of menstruation cycles and body conditions, and health management.

6.4 Feelings About Heart Rate and Physical Exercise Data

Participants tracked heart rate and physical exercise either separately or together, depending on their tracking purposes, as discussed in Chapter Four. Feelings intersect with the tracking of resting heart rate. Feeling upset about heart rate triggered worry and stress, providing awareness of checking real-time heartbeats. For example, due to a family history of heart disease, Xiaoyang was obsessed with her resting heart rate. She could physically feel her fast heart rate and always assumed hers was higher than other people's. Despite her heart rate being close to but under the upper limit of the normal range, she was always worried about it. Whenever she felt her heart rate was speeding up, she started to monitor it through her Apple Watch. This can speak to Ruckenstein's (2014) suggestion that self-tracking technologies provide alerts to draw peoples' attention to their bodily sensations and heightened their self-awareness of bodily feelings. Although monitoring equipment unconsciously increase people's attention and possibilities to see heart rate data, the example given here suggests that bodily sensations are more powerful to notice heart rate than tracking tools. This is because bodily feelings have a direct physical relation to bodies.

Physical feelings about resting heart rate were not always obvious. Self-trackers relied on data to relieve their worries, analyse their life status, and evaluate their body conditions. For example, Yan only occasionally monitored and reviewed his resting heart rate, when his life habits became worse (through working overtime and staying up late), he felt tired, or he lacked sleep. Data about his heart rate could stir Yan's emotions:

> If my resting heart rate is normal, I of course feel quite happy, because it meets my expectation. I know I am still healthy, so I feel very happy by seeing it. If it is quite high, I would think about the reasons and monitor it twice in a row and calculate an average value of my heart rate. If the mean value is still high, I analyse my lifestyle and find that I might work too hard, and my body might be too tired. Then, I try not to work overtime and go home early and get some rest at home after work. (Yan, 32, male, developer, initial interview)

Yan's happiness is triggered by seeing the data. Although Yan did not express any feeling when he knew his high heart rate, the data led him to link his data to his everyday doings to make sense of meanings behind of the data. As Pantzar and Ruckenstein (2017) have argued, visceral reactions and emotional responses to self-tracking data make data become meaningful.

Feelings about data is closely related to the context of producing and seeing data (Lupton et al., 2018; Pantzar and Ruckenstein, 2017). Feelings about the status of real-time heart rates were important signs to quickly adjust speed for those who tracked physical exercise such as cycling and running. Many self-trackers paid attention to this metric in monitoring physical exercise. They believed that heart rate could reflect the intensity of exercise in terms of both

speed and distance. For example, Xinyue rarely checked his resting heart rate, but he was interested in his real-time running heart rate. He used the JoyRun app to track running time, speed and distance and wore the Apple Watch to track his heart rate at the same time. He explained how he relied on the sensation in his heart feeling while monitoring real-time during runs:

> I pay close attention to heart rate and running speed, as super-fast heart rate can cause sudden death. [laugh] If the heart rate is too low, it means today the level of my exercise intensity is not high enough and the quality of exercise is not good. I check my real-time heart rate, which is straightforward. I usually keep it around 140 beats per minute… I can physically feel my heart rate significantly goes up, when I run again after working overtime for a while or lacking sleep. In this case, I reduce my running speed. (Xinyue, 40, male, IT engineer, initial interview)

Similarly, Yan also improved his cycling and running skills by monitoring real-time heart rate and analysing his heart rate history by wearing a heart rate belt. Physical feelings about heart rate only draw self-trackers' attention when the metric goes very high and gives obvious feelings, otherwise, people relied on real-time data rather than bodily feeling. Heart rate was treated by participants who tracked exercises as a way to avoid death risk and improve techniques when doing physical exercise. Lupton and colleagues (2018) found that their participants knew about their cycling trips and bodies through data collection and bodily feelings, and having this knowledge helped them assess changes in rides and bodies.

Many interview participants only monitored physical exercises and were not interested in heart rate. Several participants expressed their emotions in relation to patterns of represented data. In the previous chapter I discussed the goal setting features of self-tracking technologies and the way people derived pleasure from these or exerted their agency in relation to pre-set but unrealistic goals. Circles are one of the most popular patterns that participants used to view their exercise-related data. Xiaoyang had a sense of accomplishment when three rings (shown in Figure 6.5) on the Activity app of her Apple Watch were closed:

> If all three circles are closed, I must have a sense of accomplishment. I feel that today I am doing well and I have reached my exercise goal. Because the goal is set up more difficultly than my standard that I can easily achieve. Because I think it is too easy to achieve this goal, I should set it up a little higher. I think it's pretty good to see that a lot of circles appear all over the screen… It means that I exercise every day, and I persist in it. (Xiaoyang, 32, female, journal editor, family history of heart disease, initial interview)

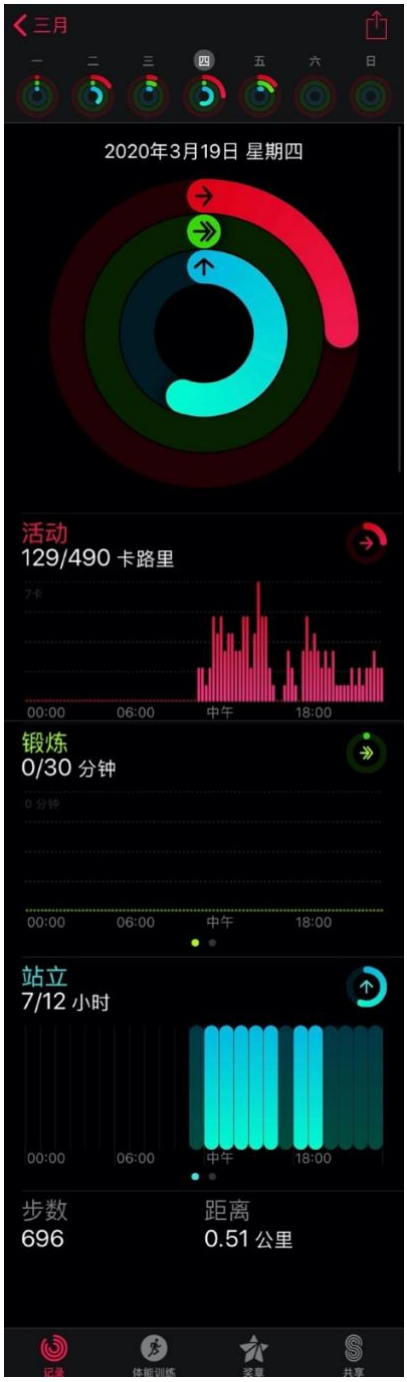


Figure 6.5: Xiaoyang's screenshot of physical exercise data

Ring patterns can also make participants feel relaxed. For example, Xiaoyang used the Apple Watch to monitor her breathing and felt quite relaxed by following the blue pattern:

> Graphics have a little guidance. The blue ring is to guide you to breathe by following its vibration frequency and rings' patterns are different when you breathe in and out. When you breathe in, the ring becomes like a blooming flower and vibration frequency is

> getting slow. It's quite rhythmic. (Xiaoyang, 32, female, journal editor, family history of heart disease, initial interview)

As mentioned above, Xiaoyang also liked to look at the rings that were shown in the calendar of the Activity app (Figure 6.6). Her emotions in relation to closing rings were mixed: on the one hand she felt challenged to close three rings altogether; on the other hand, she set up hard goals on purpose that were impossible to easily achieve, and she enjoyed challenging herself. The calendar is a common way to represent data in self-tracking data practices and this method of data visualisation evokes participants' feelings of convenience in relation to viewing data, a sense of accomplishment, a sense of self-competition, and of disappointment.

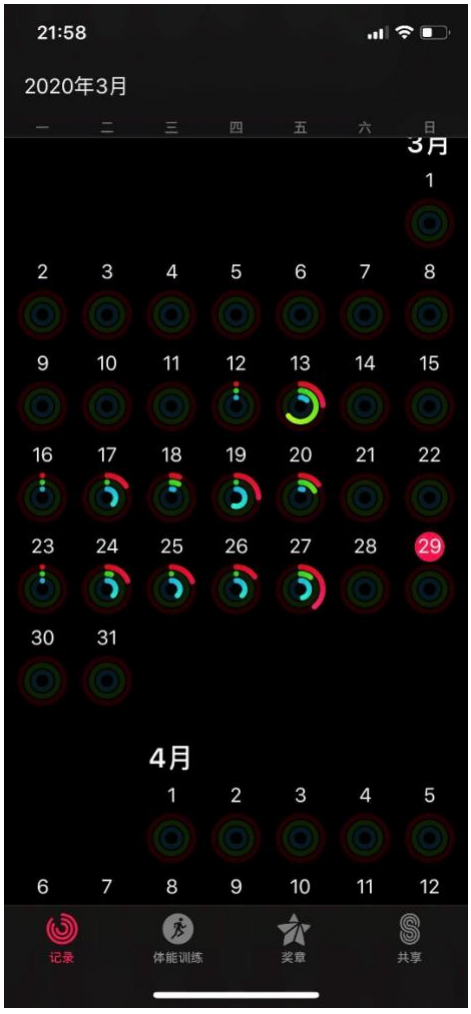


Figure 6.6: Xiaoyang's screenshot of three rings represented in the calendar

Lele also used an Apple Watch to track activities and he felt happy when three rings were all closed but he would not be upset if they were not. However, later in the interview, Lele changed his mind and expressed sad and uncomfortable emotions about what unclosed rings represented in the calendar of the Activity app – he wished he could close them every single

day. Different from Xiaoyang, Lele changed the goal setting to close rings so that he could feel happy with his achievement:

> I feel very refreshed and cool to see that all three rings are closed. It was just a tool that you use to record yourself. If there is really no way that you can complete goals, you just have to change the goal settings to be easier to make yourself look like you did it… It has a calendar that shows you how much you have done with closing rings each day. You would feel so comfortable if all rings are closed in each day (Lele, initial interview)

Yang felt motivated by closing rings and commented as follows:

> Closing rings is definitely a positive motivation, like playing a game where you continue passing levels. It gives you positive incentives. A basic theory of creating games is addiction, that it gives you an addictive mechanism. Rings show that you didn't close them yet and how much you walked, which is a positive motivation. It gives you a medal and shows you how many medals you can get and which new level you are at by encouraging you to engage with the Challenge activities… It is very easy to guide people to form a new habit. (Yang, initial interview)

However, feelings about resting heart rate occasionally appeared when people lived a hard life. Otherwise, they rarely paid attention to it in everyday life, except for people like Xiaoyang who paid close attention to her feelings about her daily heart rate. Real-time heart rate can be physically noticed when it reaches a high level that people find difficult to handle. Otherwise, real-time heart rate served as a metric to adjust speed in relation to carrying out exercise.

Many interview participants had strong feelings when they failed to collect data. For example, Yan described himself as a perfectionist. He felt annoyed when he accidently stopped tracking during running activities. Recording running data usually brought a sense of achievement but missing some of his running data led to him feeling disappointed. He remembered this type of experience and tracked his running more carefully afterwards to avoid missing data. These feelings reminded self-trackers to avoid broken data in the future.

A few participants felt anxious and a sense of loss when they noticed they had forgotten to track things. For example, Yan felt overwhelmed about partly missing data in running activities as a result of changing to a new self-tracking app. Xi felt that "empty data recording brought a feeling of anxiety" (25, female, marketing officer, history of depression and eating disorder, repeat interview).

The feelings show that data is a situated part of people's daily lives. Broken data shows the importance of data for people in observing their bodies and lives. As Yang said, if she did not wear her Apple Watch or forgot to charge it, she became anxious. Her feeling was like when she forgot her mobile phone, although it would be worse if she forgot her phone.

Personal self-tracking data are considered by many participants to be private data. Sharing of step data in public triggered people's feelings when they compared it with previous step records and/or others' steps in ranking lists on the WeRun app. People's feelings about steps in the ranking list changed during the COVID-19 pandemic. When steps increased on WeRun, some interview participants and Weibo users who posted about step data on WeRun were worried that others might assume they had broken lockdown rules. Also, some felt uncomfortable about observing other people's data when they saw it on their social networks on WeRun, for those who went outside during the pandemic. They also made fun of the data when they saw a high number of steps. Others felt touched by seeing the steps in their network showing doctors walking a lot to save lives during the pandemic.

6.5 Feelings About Sleep Data

Compared with the tracking activities above, interview participants expressed fewer feelings about tracking sleep. Feelings about sleep related to bodily feelings. Some interview participants analysed the relations between habits, data and bodily feelings. For example, Yan usually only checked the length of daily deep sleep the next day through the Huawei Exercise app if he went to bed on time, and sometimes he felt it was unnecessary to check the sleep data if he followed his regular sleep pattern. However, he viewed more sleep-related data if his body felt uncomfortable. Yan explained why he checked the data and how his bodily feelings led him to view data differently:

> If I sleep and wake up on time, my brain state and body state feel great. I usually go to bed at 11pm and wake up at 7am. If I fall asleep at 12am and get up at 8.30am, my body feels very different to usual. Although I have an extra half hour of sleep, the feeling is different. I feel dull. In this case, besides the length of deep sleep, I also check my heart rate during sleep and the time when I fell asleep and wake up. I expect to see how well I slept last night. My body immediately feels uncomfortable because of an irregular sleep pattern. (Yan, 32, male, developer, initial interview)

A few participants only viewed self-tracking data when negative bodily feelings emerged. Occasionally reviewing data helped people to temporarily solve negative feelings in terms of body and emotions. They seemed not to heavily rely on data in everyday life, while data became meaningful when needed. For example, Jiankun only checked his sleep data on the Mi Fit app and used it to explain his sleep quality when he had bad feelings:

> Interviewer: When do you view your sleep data? Could you describe it please?
>
> Jiankun: When I have bad moods, I take a look at it. When I have bad mental and bodily feelings, I also view it. For example, I wake up this morning, my bodily state is not good, so I want to check the recording to see whether I didn't sleep well last night. Except for this situation, I never pay attention to it. (Jiankun, 37, male, energy company employee, cancer survivor, initial interview)

Zoe described how to deal with the tiredness of her body, sleep data and changeable emotions:

> When I have a good sleep, my body can immediately feel it. It feels good and refreshed the next day. By viewing my deep sleep data, I start to think how to have better sleep quality. Sometimes the data says that I have enough deep sleep, but my body is still tired. That really confused me. When the data says I only had one-hour deep sleep, but I feel energetic. That confused me even more. By self-tracking for a longer period, I begin to trust myself and trust my body, rather than other people's comments or my data. If I can't figure this out, I just leave it and go to bed normally and have good sleep. Next day, the data is normal again. I also reflect on what I did when my body feels active, and what I did when my body feels exhausted.

People who paid attention to their body and mental feelings with self-tracking activities such as sleep, weight, periods or physical exercise could tell how their bodies would respond to these daily activities and changes in everyday life. These self-tracking experiences strengthened their awareness of bodily sensations.

6.6 Discussion and Conclusion

A key finding of this chapter was that people felt differently about different types of self-tracking data and data visualisations. In terms of tracking weight, data triggered self-trackers' emotions. When tracking menstruation cycle, bodily sensations played an important role in recording dates and symptoms of periods. Compared to tracking weight and menstruation cycles, participants expressed fewer feelings about heart rate, sleep, and steps.

Also, I found that participants needed self-tracking data to help them analyse the connections between bodily sensations, body states, emotions and moods, and their daily lives. Although people viewed and recorded data in different situations, negative feelings easily motivated people to engage with the data. Emotions emerge when people notice bodily feelings, which contribute to understanding the data and their own bodies. Digital self-tracking data can help people reflect on their bodily sensations and judge their bodily conditions, which triggers their emotions, for example, tracking heart rate increases people's awareness and understanding of bodies and evokes relief and anxiety. Sometimes data and bodily feelings stir people's emotions as well; for instance, late dates in the menstruation cycle and uncomfortable bodily feelings can cause anger and worry, which disappeared once people physically feel better.

The third finding of this chapter was that embodied sensations and self-tracking data worked together to make people pay close attention to their self-tracking data practices; for example, feeling heavier and seeing the weight data motivates people to record, view and review their weight data. Digital self-tracking data are seen by people as a way to reflect on their embodied sensations, and the data also stirs their emotions, influencing their attitudes and

actions in self-tracking data practices and everyday activities. In turn, embodied sensations and feelings towards self-tracking data become intertwined with the data.

Chapter 7 Social and Communicative Meanings of Self-Tracking Data in Sharing Practices

7.1 Introduction

Sharing is a powerful way to heighten self-trackers' awareness of the meanings of their self-tracking data. In this study, sharing refers to sharing aspects of life, sharing as a form of documenting life or of self-representation, and sharing as a form of sociability and an act of communication. Within practices of sharing self-narratives about self-tracking data to the self and other people, identities are constructed and performed. Self-narratives and self-representations through data are also attempts to communicate with people. John (2013a) identified that the term 'sharing' on social network sites refers to an act of communication: sharing is telling. It implies interpersonal relationships based on trust, understanding, empathy, honesty, mutuality and concern. People distribute digital materials to others and communicate about their everyday lives (Brake, 2014). This chapter aims to examine the key themes of self-documentation of lives, self-representation, and communication through sharing data practices by analysing interview participants' sharing experiences, their shared online content, and Weibo users' public posts.

This chapter covers two types of data: interview and social media data. Both types of data analysed together to develop the arguments in this chapter because, although I observed that many posts on Weibo talked about self-tracking, most of my interview participants said they did not share their data much on social media. When they occasionally shared, they said that they did so on WeChat. Although they said they rarely shared their self-tracking data on social media, after initial or repeat interviews, they did admit to sometimes sharing on Moments. Nine interview participants who talked about sharing experiences are included in this chapter to demonstrate where, why, what and how they shared about self-tracking data and who they shared with. Some participants who said they rarely shared on social media actually allowed WeRun on WeChat to automatically share their daily step data within their personal networks on WeChat. As such, I found that several interview participants did occasionally share their data on Moments on WeChat while other interview participants never shared, as they explained in interviews. This inspired me to further explore what other self-trackers discuss on social media when they do share, since much sharing occurs on Weibo. Semantic network analysis of social media posts helps to explore what people share in public in relation to self-tracking.

Sharing practices discussed in this chapter refer to online sharing on two Chinese social media platforms – Sina Weibo and WeChat – and offline sharing in person. Self-trackers on both platforms in this study generally shared a broad range of topics, including self-tracking data, their lives, experiences and feelings. Posts on Sina Weibo were published publicly to audiences who were friends in social networks (including following or follower lists) or broadly imagined audiences (Rauchfleisch and Schäfer, 2015). Their audiences had relatively loose relationships with the people who shared on Weibo (Mo and Leung, 2015; Tu, 2016).

Interview participants shared on public Moments, private group chats, and private individual chats on WeChat. Within Moments on WeChat, posts were only visible to people who were friends with each other on WeChat, and the participants usually had a closer relationship with their audiences on WeChat than on Weibo. The audiences of interview participants who shared on Moments were their friends on WeChat. Offline sharing happened between partners, families, friends, colleagues, and within other social networks. This study of sharing on two Chinese social media platforms builds on and extends contributions to existing knowledge about sharing self-tracking data on Western social media platforms.

This chapter investigates three key themes: self-documentation of lives, self-representation and identity constructions, and communication through sharing data practices. It does so by analysing interview participants' sharing experiences, their shared online content, and Weibo users' public posts. Section 7.2 explains how three themes were identified in the semantic network and how this helped to arrive at two of the themes of this chapter in sections 7.3 and 7.4. Sections 7.3 and 7.4 discuss each theme that appeared in the semantic network: 7.3 explores how people share their everyday lives and data as a way of documenting experiences and life; 7.4 then discusses implicit and explicit forms of self-representation through sharing self-tracking data. Interviews were added as supplementary data to develop arguments in both sections. Following interview participants' stories, section 7.5 focuses on sharing self-tracking data and experiences online and offline to investigate how people communicate in different contexts (publicly online, in intimate relationships, family life and workplace). It introduces the idea of voluntary and reluctant communication in sharing data practices. Social media posts were used as supplementary evidence to support the analysis in this section.

7.2 Three Themes from Semantic Network Analysis

This section summarises the output of the semantic network analysis, which helps with understanding how the themes for each cluster were identified. It also briefly explains how the first two themes of this chapter arose through combining each semantic theme with qualitative thematic analysis of original posts on Weibo and WeChat and interviews. This section reports the results of quantitative measurements of the centrality of words and explains key themes that were identified by combining this data with the quantitative results. Through the semantic network analysis of the words in a corpus of Chinese posts on Sina Weibo, the network visualisation of co-occurring words in Figure 7.1 was obtained. The size of the most central words was measured in terms of betweenness centrality. It shows three semantic clusters indicated in three different colours, and each cluster community represents a theme based on word co-occurrences. Table 7.1 summarises the top 31 central words in this overall semantic network to provide evidence of how central words in clusters were identified. As discussed in Chapter Three, betweenness examines the numbers of shortest connections between two words, frequency examines the frequency of words written in overall posts, and eigenvector tests the connections between high value central words. Table 7.2 lists themes and co-occurring words in each cluster to help to understand how the semantic themes were identified. Chapter Three explained that association counts relates to

frequency of connections between two words, and share of the network evaluates the density of connections between central words in a cluster.

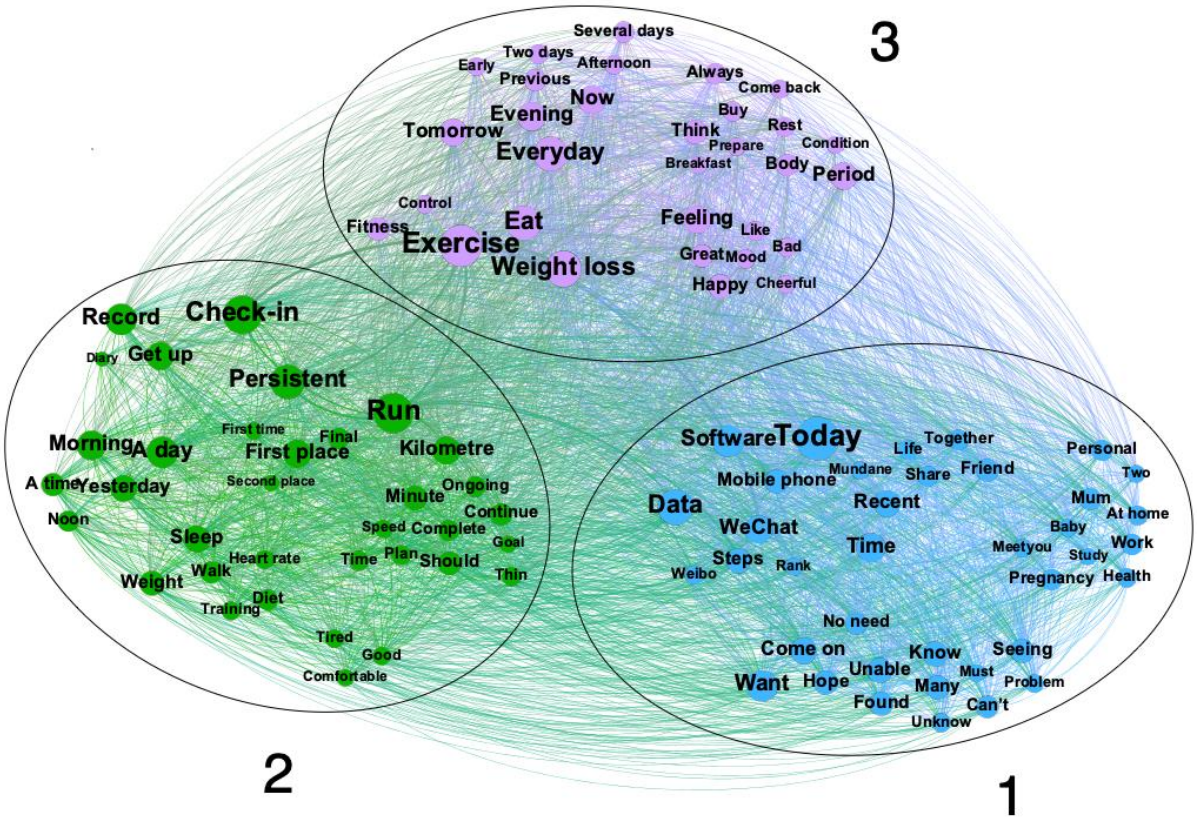


Figure 7.1: Cluster analysis of the self-tracking discourse on Weibo

Words	English Translation	Betweenness Centrality	Rank	Frequency	Rank	Eigenvector centrality	Rank	Cluster community
今天	Today	54.619355	1	1208	8	1	1	1
运动	Exercise	51.558825	2	3765	1	0.98434	2	3
跑步	Run	48.658554	3	3277	2	0.968425	3	2
打卡	Check-in	45.899971	4	1947	3	0.939902	4	2
减肥	Weight loss	41.345368	5	1680	4	0.917065	7	3
数据	Data	40.50265	6	1324	6	0.929746	5	1
吃	Eat	39.506384	7	832	10	0.920081	6	3
坚持	Persistent	38.298201	8	1267	7	0.889937	10	2
每天	Everyday	38.260998	9	333	26	0.89116	9	3
软件	Software	33.216018	10	782	11	0.868894	11	1
记录	Record	33.143735	11	531	16	0.84555	13	2
一天	A day	33.09442	12	425	19	0.857988	12	2
想	Want	32.843738	13	427	18	0.893266	8	1
早上	Morning	29.520035	14	251	30	0.809363	19	2
晚上	Evening	28.765638	15	347	24	0.835393	15	3
时间	Time	28.546175	16	417	20	0.836938	14	1
微信	WeChat	27.466871	17	1626	5	0.817801	17	1
现在	Now	27.41383	18	338	25	0.828281	16	3
第一	First place	27.248146	19	363	21	0.805432	21	2
感觉	Feeling	27.074794	20	349	23	0.815387	18	3
起来	Get up	26.627378	21	291	27	0.807453	20	2
公里	Kilometre	26.620166	22	712	12	0.782297	24	2
明天	Tomorrow	25.845076	23	271	29	0.797046	22	3
姨妈	Period	25.240525	24	835	9	0.784983	23	3
睡眠	Sleep	24.762309	25	550	15	0.764905	25	2
加油	Come on	24.359874	26	445	17	0.741768	30	1
最近	Recent	24.346449	27	224	31	0.763941	26	1
昨天	Yesterday	24.309357	28	283	28	0.741587	31	2
知道	Know	21.765187	29	352	22	0.762957	27	1
步数	Steps	20.984948	30	691	13	0.757076	28	1
体重	Weight	20.878828	31	634	14	0.745512	29	2

Table 7.1: Summary output of the top 31 frequent words with central measurements: betweenness and eigenvector centrality and cluster coefficient

Theme	Top associations (with English translation)		Association count	Top associations (with English translation)		Association count	Cluster colour	Share of the network (%)
Storytelling personal daily lives and data producer in everyday life	Data	Run	742	Today	Study	42	Blue	36.54
	Data	Steps	414	Today	Software	39		
	Software	Period	231	Data	Heart-rate	35		
	WeChat	Steps	158	WeRun	Mundane	35		
	Today	Run	103	Mundane	Exercise	34		
	Pregnancy	Mum	70	Today	Morning	33		
	Today	Weight loss	63	Today	Yesterday	25		
	Today	Eat	50	Today	Evening	24		
	Data	Today	47	Today	Weight	24		
	Today	Period	47	Today	Conditions	19		
	Today	A day	43	Record	Life	13		
Mixed cluster: 1. Storytelling daily lives and data 2. Self-disciplinary and competitive identities to achieve goals	Run	Step	605	Run	Complete	61	Green	33.65
	Check-in	Exercise	594	Check-in	Today	59		
	Run	Kilometres	164	Check-in	Diary	57		
	Check-in	Sleep	158	Run	Plan	37		
	Diary	Weight loss	138	Complete	Today	36		
	Check-in	Fitness	114	Check-in	Breakfast	34		
	Weight	Goal	95	Persist	Come on	30		
	Check-in	Weight	88	Complete	Plan	29		
	Persist	Fitness	82	Persist	Weibo	23		
	Persist	Weight loss	78	Check-in	Heart rate	18		
	Run	Come on	62	Persist	Health	15		
Healthy identities through a weight loss practice in a scientific way	Exercise	Run	1138	Health	Run	24	Purple	29.81
	Exercise	WeChat	1697	Period	Feeling	17		
	Meetyou	Share	170	Breakfast	Weight	14		
	Exercise	Fitness	141	Weight loss	Mundane	14		
	Weight loss	Run	108	Weight loss	Health	13		
	Period	Record	102	Eat	Happy	13		
	Weight loss	Weight	89	Eat	Control	13		
	Eat	Want	67	Heart-rate	Control	13		
	Weight loss	Fitness	49	Control	Diet	13		
	Exercise	Weight	35	Health	Happy	13		
	Exercise	Health	34	Exercise	Happy	12		
	Breakfast	Diet	31	Mood	Bad	11		

Table 7.2: Summary output of the modularity analysis of the semantic network

Cluster 1 at the bottom right is the largest cluster in blue (36.54%) and represents the topic of using self-tracking data for storytelling about various aspects of everyday life. Data in Table 7.1 suggests that cluster 1 revolved around the central word 'today', as it has the highest value of betweenness and eigenvector centralities in the overall semantic network and in the cluster. In terms of betweenness, this means the word 'today' had the highest numbers of short paths to connect with other words in cluster 1 to create shared meanings as a theme. Central words with a high value of betweenness not only share meaning with their other linked words within the cluster but are also often positioned between distinctive clusters and can help to extract the narrative of sharing the meaning with other others in the entire network (Segev, 2021). The word 'today' connected with central words in two other clusters, which contributed to the theme. The highest eigenvector showed that in this overall network the word 'today' linked to the highest numbers of other central words with high values of betweenness. Both measurements demonstrate the importance and influence of the word 'today' within both cluster 1 and the other two clusters. Table 7.2 shows that the central word 'today' was linked with words such as data (数据), software (软件), study (学习), pregnancy (孕), and mum (妈妈) in cluster 1, with words in cluster 2 such as morning (早上), record (记录), run (跑步) a day (一天), and with some words in cluster 3 such as weight (体重) and eat (吃) in cluster 3. There were also semantic connections between other important central words such as data (数据) and run (跑步), WeChat (微信) and mundane (日常), and mundane (日常) and exercise (运动). Figure 7.1 also showed some fewer central words that were excluded in the two tables, such as work (工作) and friend (朋友), which also link to the influential central words in cluster 1. Therefore, in cluster 1 the posts that contained these linked words showed the theme that self-trackers narratives include multiple aspects of personal daily life, covering a range of different topics from self-tracking experiences and data to study and work, from diet to social relationships and pregnancy stories. For example, it reveals that Weibo users frequently talked about what data (数据) they collected via software (软件) today (今天), and what their mundane (日常) work (工作) life (生活) or study (学习) life (生活) looked like today (今天). Additionally, thematic analysis of Weibo posts shows two main patterns of talking about lives and interpreting data: 1) hashtags (e.g., #checkin# or #record# or #weightcheckin#); and 2) textual patterns such as diaries, records, check-ins, day + number, or date. By considering what aspects of daily life were shared in cluster 1 and of how Weibo users shared these diverse aspects of their lives in these two ways, the first key theme of this chapter was identified as self-documentation of life through the medium of self-tracking data on social media.

Cluster 2 at the bottom left, in green, is the second semantic community (33.65%). It is a mixed cluster that partly shows other specific aspects of daily lives and partly represents self-disciplinary identities and the competitive self in self-tracking practices on Weibo. According to the measurements in Table 7.1, the most central word in cluster 2 is 'run' (跑步); other central words include check-in (打卡), persistent (坚持), record (记录), first place (第一), continue (继续), complete (完成), goal (目标), and diet (饮食). Table 7.2 illustrates that these central words in cluster 2 connect with the words in cluster 1, such as today (今天),

check-in (打卡) and diary (日记). These linked words reveal two key ways of sharing these various dimensions of daily lives.

These central words shared meanings with other linked words in cluster 2. Table 7.2 suggests semantic relations between two central words in cluster 2, such as run (跑步) and steps (步数), run (跑步) and plan (计划), check-in (打卡) and sleep (睡眠), run (跑步) and complete (完成), persistent (坚持) and come on (加油), complete (完成) and plan (计划), and weight (体重) and goal (目标). It shows how Weibo users also used both hashtags and textual patterns to motivate themselves to maintain achievements such as weight loss, sleeping better or running improvements. This represents disciplining the self by self-tracking and sharing self-tracking data.

According to the two tables, the third cluster at the top middle in purple (29.81%) contains the most central word exercise that links with other words such as run (跑步), WeChat (微信), health (健康) and happy (快乐). Other semantic relations include weight loss (减肥) and run (跑步), weight loss (减肥) and health (健康), control (控制) and diet, heart rate (心率) and control (控制), (饮食), health (健康) and happy (快乐), eat (吃) and control (控制), and Meetyou (美柚) and share (分享). Cluster 3 shows health identities in the context of weight loss. It suggests that Weibo users tracked and shared health-related information (e.g., food, physical exercise, weight and menstruation cycle) to lose weight in a healthy and scientific way. This represents health identities by tracking relevant data and reflecting on them online.

To conclude, three themes were identified within the semantic network analysis. These were: documenting everyday life; representing self-disciplinary identities; and performing healthy self. They fit into the first two themes of this chapter which address self-documentation and self-representation. These themes overlap, as forms of self-documentation are a process of identity construction (Gorichanaz, 2019b). In this way, section 7.3 focuses on what and how lives are documented through data, and the examples used in this section are also used in discussions about self-representation in section 7.4.

7.3 “I Share My Life, Not My Data”: Sharing Data as Self-Documentation of Life

As seen in Chapter 5, self-tracking data were interwoven into people’s work, family, and personal lives. Lomborg and Frandsen (2016) suggested that self-tracking experiences and data are embedded into the fabric of everyday life. To highlight the importance of experiences and life for understanding the meanings of data for individuals, Gangadharan and Niklas (2019) argue that researchers should not start with questions about data, but rather they should talk about peoples’ lives to see where data fits in. Data become part of talking about personal experiences and daily lives and sharing self-tracking data on social media can be seen as a documentary practice. In research on conceptualisation of self-documentation, Gorichanaz (2019a) included forms of self-documentation such as selfies and self-tracking data. This section reveals that not only self-tracking data themselves but also sharing the data

were considered to be ways of recording daily lives. Through the lens of sharing practices publicly on social media, this section explores what and how people documented their daily lives and habits, and what role self-tracking data plays in self-documentation of mundane lives. Two styles of documenting life are discussed in this section: sharing centred around daily lives, and lists with brief comments about lives and data.

7.3.1 Life stories as the centre of sharing

Previous studies have found that self-documentation is one motivation for using social media platforms (Alhabash and Ma, 2017; Chen and Peng, 2022). People share their most relevant and interesting content on social media (on Twitter, Facebook, Instagram, WeChat) as status updates, and this includes exercises and health-related information (including weight, sleeping habits, food consumption, medication intake, footstep counts, relationship status, and the habits of new-born babies) (Kent, 2021; Li et al., 2010). Clusters 1 and 2 suggest that Weibo users share broad life stories such as pregnancy, studies and work, with these topics sometimes being discussed together in posts. In a thematic analysis of these original posts published on WeChat and Weibo, I found that self-tracking data were not generally the central point of a post on WeChat and Weibo; rather sharing life stories occupied the central space in the post. However, data played a key role in creating excuses to document a person's life on these platforms.

A few interview participants who shared their data on Moments on WeChat recorded various incidents from their daily lives and data. They explained that for them self-tracking data were used as a material part of documenting their lives. For example, Hongbin explained that he did not take self-tracking seriously. Rather, he used his daily data and data visualisations to record his life and shared them on Moments on WeChat to document his life:

> I review fitness data and graphs to understand how many times I work out in the gym during a week. For me, tracking these things is more like recording my life. I take it easy. The main point is that I feel happy by doing exercises… Nowadays, I sometimes share my data like skiing distances, but I also share my photos about the moments when I am skiing. Sharing them for me is just the way to document my life. As we go to many places for skiing, sharing them is the same as sharing my travel journey. (Hongbin, 31, male, self-employed, initial interview)

This example revealed that Hongbin was not obsessive about self-tracking and that he shared data and photos to represent his life. He used the phrases "record life" and "document life" to explain data and data visualisations and sharing data on Moments on WeChat had a documentary meaning. People perform for others and capture moments of their daily lives for themselves, which allows them to revisit these captured moments as recorded in the past (Gorichanaz, 2019a, b) or to recall them in the future (Rettberg, 2014). The documented materials allow people to recall historical events when they look back on the content. Several participants shared special moments and good data (which they were satisfied with) on Moments as a form of meaningful commemoration (Cao et al., 2020; Gan and Li, 2018).

They went back to check their previously shared posts as good memories and to remember their old lives and experiences. For example, Ying described how reviewing her step data took her back to a special day in the past:

> During the holiday, we had a super high number of steps and walking distance was also very long. We think it was a commemorative day and our travelling story was worth sharing on social media. So we shared this. Even today, I occasionally looked back on this, and think "wow, the [step] data was really high on that day". I think sharing this was more like a meaning of commemoration. (Ying, 25, female, Internet employee, initial interview)

Similarly, self-documentation of life on Weibo was sometimes treated as writing digital diaries, and self-tracking data enriched the content of documented life. As mentioned in section 7.2, two ways of documenting life were commonly used to record lives and data: hashtags and textual patterns. For example, Hongtao – a Weibo user who used the hashtag #heartraterun# to track his running – tracked his runs for 955 days and shared his life through his running data almost every day. His posts using the hashtag described looking forward to going home, his running shoes, the weather and seasons, work, running changes and improvements, and other aspects of his life. According to his posts, he counted the days he stayed in one place through sharing his life and data; and the more days he recorded, the closer he got to his return home. One of his posts showed his running data summary and a photo of a flower on the 44th day:

> #heartraterun# Day 44, Sep. Run 13th day, the speed of increasing temperatures in the autumn is faster than tigers and it starts to continue going up. So I changed to have the previous habit that goes for a run in the morning then. Today, my best heart rate is 10KM. Come on… The flowers on the road have very pretty shape…
>
> Comment: Does it look like a COVID-19 virus? (Hongtao, Weibo user, received one comment)

Figure 7.2: Screenshot of running data in Hongtao's Weibo post

Figure 7.3: Photo of flower in Hongtao's Weibo post that he took when he was running

In this post, Hongtao calculated the number of days he had tracked his running and heart rate, analysing the results of his heart rate during running. The words "come on" and "best"

showed his successful running experience, while the flowers in the photo symbolised his satisfaction with his data. Documenting life for people like Hongtao became a type of mundane companionship and spiritual comfort, and data represented the oil of self-motivation and self-satisfaction.

Taking one of her posts as an example, which received one 'like', Di talked to her unborn baby and described her recent pregnancy challenges, the results of that day's regular pregnancy check, and her decision to use a fertility tracker to calculate her baby's growth:

> "Pregnancydiary" My little cutie, today you are 11+5 (11 weeks+5 days), but NT (the fertility tracker) shows 11+6, and the doctor says that I should count it as 11+4 since my last period, but I decided to follow the pregnancy analysis of the fertility tracker. Recently, my main pregnant reaction is flatulence, which is uncomfortable, and I have to drink sparkling water to burp, which makes me feel comfortable a little. Although I cannot eat food, I still try my hardest to eat something. For your health, I can overcome this. Look! Look at you a little lazy [in this scan picture], today… Please grow healthily, my little baby, mummy loves you. [Love you] (Di, Weibo user, received one 'like')

Figure 7.4: Photo of Baby B's ultrasound scan in Di's Weibo post

Di used a popular hashtag, "pregnancydiary" to document her daily life and her feelings, bodily changes and thoughts about her baby and her bodies' condition after his birth, from the first day she tested positive for pregnancy. Her aim was to communicate with her unborn baby through documentating her experiences and the baby's daily growth. All her posts with this hashtag represented her love for her child, along with her emotions–ranging from happiness to sadness–about her baby and her own experiences. The hashtag "pregnancydiary" was widely used by many Weibo users to write pregnancy diaries. By using well-known hashtags, self-trackers tended to document their lives not jusr for themselves but also for an imagined community of people who used the same hashtags to share similar pregnancy

experiences. Data were embedded into much of the content and storytelling about her pregnant experiences.

Hashtags such as “pregnancydiary” and “weightlossdiary” were widely used by self-trackers on Weibo to record their lives. Weibo users attempted to record their lives to communicate with themselves, imagined audiences, and those who used the same hashtags. In another example, Yu’s post with one ‘like’ listed fitness and exercises that she had done that day, described her self-tracking data and attitudes about data accuracy, and talked about feelings in relation to running and family visiting.

> #BrotherYu’sexercisediary# ✅Beauty Ballet both sides once; ✅Hanxiaosi’s [fitness programme] exercise on inside thigh + calves; ✅cGe [fitness programme] correction exercise on calf eversion. In the evening ✅The Wizard of Oz running very cool. I found that data produced via the iWatch and mobile phone was quite different that the watch recorded 50 burned calories less, but it is not a big deal. Now the weather is getting cooler and after running the smelly sweat is easily gone by a walk for a while, so it is quite comfortable as well 😊. This morning I had vegetable juice. Tomorrow mum will come over! Such a beautiful day is going to end again! (Yu, Weibo user, received one ‘like’)

Figure 7.5: Screenshot of running data produced by Apple Watch included in Yu’s post

Figure 7.6: Photo of vegetable juice added to Yu’s post

Emotional descriptions in both posts focused on participating in activities and personal experiences in daily life, while self-tracking data was obliquely mentioned in the posts. Bespoke hashtags like #BrotherYu'sexercisediary# were created by self-trackers to communicate with themselves and their imagined audiences who might see or use the same hashtags. By clicking on a hashtag, all posts by the person named in the hashtag would be shown. This means these self-narratives were ways for self-trackers to share aspects of their lives, for both the present and future. Over seven months, Yu published 34 posts with this hashtag on different topics, including data from her Apple Watch, description of her fitness routines, exercises, high-calorie and healthy meals, thoughts on TV programmes, personal narratives about injuries and friendships, and celebrations of traditional Chinese festivals.

In short, this section discussed how interview participants occasionally recorded their lives and data on Moments on WeChat and used the shared content as a way to look back on their life histories. Weibo users wrote digital diaries to document their lives and data either for themselves or for people in particular communities such as pregnancy or exercise groups. A common characteristic of documenting life on Moments on WeChat and on Weibo was the emphasis on storytelling; life stories was key in sharing practices, and data were relatively less frequently described but always included in posts.

7.3.2 Lists and brief comments about lives and data

The other style of documenting life can be brief but detailed. Rather than writing stories and thoughts, people carefully list things that happened to record their lives. Self-tracking data as a form of self-motivation was afforded more attention in posts. For example, Bixia shared the second day of conditions about their exercise, diet, and weight to motivate herself to achieve her weight loss goals:

> #weight loss check-in# 📝Day 2 Check-in 📝Exercise chapter: 🚵🚵🚵 1. Morning: None. 2. Evening: None. Diet: 🍔🥗🥘 1. Soup with eggs and seaweed. 2. Red dragon fruit*1 and orange*1. 3. Meal with colleague. Snack: 🍮🍗🍭several pieces of dried apricots. Extra (experiences): 🤺🎧🏂🤾 1. Can't deal with cats 😺😺 ❌. 2. Posture master 👯👯 ❌. Weight: weight myself without any clothes every day when I get up ‼️Do take a photo. Today: 147.10. Yesterday: 148.70. Original weight: 148.70. Lost weight: 1.6 Jin. Body measurements: measure it every month and record the data. Thought: 🤍💜💛💚💙 my plan was completely disrupted by having a meal with colleagues and drinking some alcohol. Continue doing it, come on. (Bixiao, Weibo user, received one 'like')

This is a typical example of how Weibo users document their lives and data on Weibo in detail. Hashtags and the pattern 'Day + number' were combined as a form of self-documentation and self-encouragement. Listing different aspects of self-tracking data was popularly used to record the data they produced in their daily lives such as exercises, diet,

weight loss and thoughts about the self. This type of sharing also suggests that self-documentation of lives was driven to monitor the self and motivate the self to achieve goals.

The examples shown in both sections above suggest that Weibo users often took the documenting of their lives and data seriously and they were open to sharing their lives. This was different from interview participants' reported sharing experiences. For example, Wen sometimes shared her swimming data on WeChat Moments. Her post in Figure 7.7 described how she came back from swimming and saw energetic ladies dancing with music every day outside the building, which motivated her to swim. She shared this post with a screenshot of swimming data and a picture of a bowl of strawberries. In a comment, she replied to her two colleagues that she would invite them to join her for a swim after work the next day.

Figure 7.7: Wen's post about swimming and her neighbours' dancing in summer on WeChat Moments

(received one comment from Wen to invite her colleagues to swim with her next day)

Compared with Weibo posts, Wen's post on Moments was written more briefly. There was no example in this study where interview participants published a long, detailed post to document their lives and data. Posts on Moments on WeChat were visibly more private and less open than on Weibo. The differences in visibility and publicness were associated with how people narrated their selves and lives.

7.3.3 Intermittent self-documentation of life and data

One phenomenon that emerged from analysing posts on Weibo and WeChat was that documenting life with self-tracking data was intermittent. John (2013b) suggests that people are invited and encouraged to share on social media. The affordance of persistent sharing on social media provides the ability for continual self-documentation of a life and the constant ability to review previously documented events. Sharing patterns such as hashtags, "Day + number" and/or "check-in" encourage self-trackers to share, retaining this sharing habit was not always easy for people. However, I argue that sharing life was associated with life routines, self-tracking practices, and discerning work around whether and when to share. I found that documenting life continued for different periods and stopped and started, either temporarily or permanently. Self-documentation of life was maintained for long regular periods on Weibo, when self-trackers wrote digital diaries to record important details of daily lives. As per the earlier example, once Di's baby was born, such data disappeared from her digital diaries on Weibo. Di gradually stopped documenting her life and body after her son was born, and completely stopped documenting her life when her son grew to 5 months.

Different reasons for intermittently documenting lives were expressed by Weibo users, such as goal changes, forgotten passwords, distractions from busy life, recovery time for illness, and regular breaks during menstruation cycle time. For example, as discussed above, Yu used the personalised hashtag #BrotherYu'sexercisediary# to share about her life. She temporarily stopped sharing her life on a few occasions, such as when she stopped participating in self-tracking exercises, including during her period, experiencing lockdown during the COVID-19 pandemic, snowy weather, and back injuries from dance. Unexpected events in everyday life can distract people from documenting their lives. The achievement of life goals was strongly linked to motivations to document lives. For instance, as discussed above, Di documented her pregnancy process until her son was born, and Hongtao recorded his daily life of being stuck in a place by sharing his everyday life through running data – he completely stopped sharing once he eventually went home.

As data are important sharing materials, having no data to share can reduce the possibility of sharing. Although self-narratives on different aspects of daily life in many posts were central, self-tracking data were included in every post. Even though data were briefly mentioned in posts, they were an indispensable part of sharing daily life on social media. For example, in some of Yu's posts with the #BrotherYu'sexercisediary# hashtag, she wrote that she added data from yesterday or earlier and then at the same time she described her daily life on the same day she published the posts. Some issues (e.g., snow, back injuries) distracted her from participating in activities and removed her opportunities to track and produce data. This shows that data increases people's willingness to share and provides opportunities to talk about their mundane lives online. Data was not necessarily included in random posts but was an important inclusion in posts for the serious purpose of documenting life.

Data can provide an excuse to share lives, but people can postpone sharing practices. In this way, life documentation might happen occasionally rather than consistently, as with the habit of writing in a diary. Occasionally sharing aspects of everyday life on social media is also a

form of self-documentation. For example, interview participant Xiaoyang explained the moments she wanted to share through her step data on Moments on WeChat:

> It is hard to say. I just feel like I want to post something on Moments and right now I just have material step data to share, so I just post it online. It is part of my daily life. (Xiaoyang, 32, female, journal editor, family history of heart disease, initial interview)

This type of sharing was not planned, but the shared content became documents stored on social media. Self-documented materials on social media were used to remember past life events.

This section discussed the self-documentation of everyday life. I argued that people documented their daily lives in such a way that self-tracking data was mentioned, but not central to the post. I also discussed the social sharing of self-narratives through self-tracking data whereby data was a central element for storytelling about mundane life events. Social media is a space in which people present their daily lives as digital diaries through data–such data highlights their shared ordinary lives. The analysis started to explore what online identities were represented within these published posts, a theme that I developed further in Section 7.4. However, self-documenting lives with data usually occurred for a short period, and people recorded their lives only temporarily or occasionally through sharing their stories. Additionally, there were two differences between sharing life and data on Moments and Weibo. Interview participants only occasionally shared data and lives, which allowed them to reminisce about past experiences. Weibo users sometimes continued sharing every day over a short period. Interview participants tended to share brief and short stories on Moments, while Weibo posts were often detailed and sometimes even included detailed and long stories.

7.4 Explicit and Implicit Forms of Self-Representation

As discussed in the last section, data occupied less space in posts about documenting life but still played an indispensable role in self-narrating life stories and personal experiences. At the same time, these stories reflected the expressions of Weibo users' identities. Sharing self-tracking practices supplemented the act of sharing subjective everyday life narratives on social media and enriched personal intimate stories about the self. Researchers point out that self-tracking serves to aid identity construction (Kent, 2020b; Sharon and Zandbergen, 2017). Sharon and Zandbergen (2017) suggest that self-tracking data contributes to constructing personal stories and identity. Sharing personal self-tracking data on social media also involves identity construction work. It was notable that shared self-tracking data was often represented as textual descriptions in posts or as screenshots or photos of data records from devices and apps. The data was commonly shared with textual interpretations and other forms of visual content (e.g., emojis, photos, selfies and videos). These textual and visual materials were instrumental in not only storytelling personal private experiences and interpreting daily lives but also representing the self. This speaks to Jill Walker Rettberg's (2017) definition of three forms of self-representation on social media to express the self: visual content (e.g.,

selfies, images, icons), written content (e.g., online diaries), and quantitative data (e.g., steps) – these three forms overlap when it comes to shared content on social media platforms. As discussed in Section 7.2, the data shared on both platforms was selected by individual users. The decision behind these shared stories and data can present the online self. In my analysis, mixed Cluster 2 partly showed the main themes of self-discipline and the competitive self, and Cluster 3 represented health identities. Therefore, this section explores how online identities were performed by users sharing self-tracking data on Weibo and WeChat in explicit and implicit ways.

7.4.1 Explicitly sharing to represent self

Many Weibo users and some interview participants explicitly represented a comprehensive sense of self or everyday life on social media. They shared positive stories with good self-tracking records that they were proud of. They sometimes also shared negative self and life experiences such as complaining about their failure in self-tracking practices or difficult moments from daily life. Clusters 2 and 3 revealed disciplined self, competitive self and healthy self. Thematic analysis of posts on Weibo and Moments on WeChat showed how these identities were performed and that they were sometimes constructed alongside other aspects of the self.

In Section 7.3 the analysis suggested that a combination of hashtags and written expressions with visual content are used to represent self-disciplined identities. This self-disciplined identity tended to act as motivation to persevere in self-tracking practices and in living an active and healthy lifestyle, by recording dates and categories of self-tracking data on Weibo. Textual expressions such as #check-in#, #record#, 'diary' and 'Day + number' allowed self-trackers to reflect on their efforts to be self-controlled and self-disciplined, and visual content was used as evidence of this self. For instance, Hongtao shared the online record of his 44th running day with a screenshot of his running routine; Yu shared running-related metrics and described her fitness records with a photo of a cup of vegetable juice; Bixia documented experiences of her second day of weight loss and added her weight-related data in text form. These examples show that people use both self-tracking data and forms of sharing to create and disseminate self-disciplined identities on social media. The explicit sharing of oneself represented people's motivations for being self-disciplined, their satisfaction with their successful achievement and improvement, and their healthy lifestyles.

Directly showing visual bodies also represented a disciplined self. For example, Xi used to share her life and data when she studied in the UK but stopped sharing after returning to China. She started to share her data in relation to fitness after initial and repeat interviews (see Figures 7.8 and 7.9):

> Since I came back to China, I did not continue workouts and did not have any achievements, so I did not want to share this online. However, I sometimes shared my fitness photos on WeChat Moments in the UK, as I continued tracking this and had some achievement. For me sharing this on social media was a way of recording; my

sharing can also be an encouragement for other people who see my posts. Therefore, I shared my data with the public. However, I never shared this since I came back to China, as I did not make it better. (Xi, 25, female, marketing officer, history of depression and eating disorder, repeat interview)

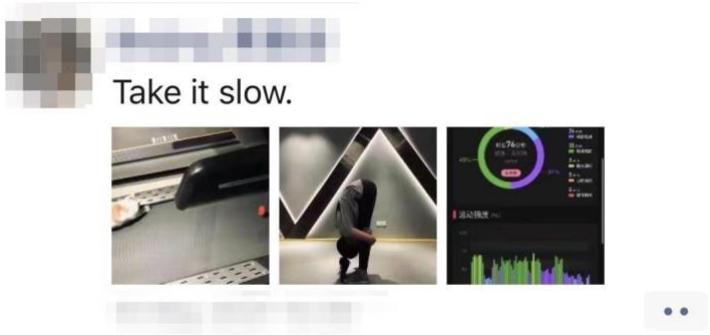


Figure 7.8: Xi's post about exercise and heart rate data on WeChat Moments

Figure 7.9: Xi's post about her life and wearing a tracker for fitness on WeChat Moments

In Figure 7.8, in her post on Moments, Xi said that she should take it easy to achieve her training goals and shared a photo of a yoga position and a screenshot of body metrics (heart rate, training with her personal coach, sugar burned, calories burned etc.). In Figure 7.9, she described her situation and feelings before and after a workout: she easily rode a bike to the gym but after training with her coach her whole body felt sore, which felt like eating lemons. Although the posts talked about her attitudes, story and bodily feeling, the attached photos mainly showed detailed of self-tracking data and good body shape. Figure 7.9 shows selfies of her body shape and arm muscles wearing a wristband. It generally takes a while to develop a muscular body. Showing her satisfaction with her current body shape implies she was a self-disciplined, fit and active person. Thus, being active, self-disciplined and healthy can be represented through various angles of lifestyles and bodies.

However, it is sometimes difficult to maintain self-control and discipline. Similar to Xi's explanation, self-trackers on WeChat and Weibo tended to show off the successful process of self-discipline to perform a positive side of the self. Social media platforms in this study were used to reflect challenges of self-control as well. For example, Weibo user Hong listed each meal during the day during their effort to lose weight, despite the struggles of eating less and exercising:

> Diet diary Countdown 77th day
>
> Today's weight: gram 👉Target weight: 100 Catty (50kg)
>
> Exercise: Beijing is a bit cold after the beginning of October
>
> Breakfast: milk, egg, purple sweet potato, multigrain rice
>
> Lunch: pancake, cabbage, carrot, nuts, and yogurt
>
> Extra meal: yogurt, nut bar, instant noodles, chick breast, vegetable, soy milk, and grapefruit
>
> Today I ate too much, and I must exercise. Lately, I cannot help wanting to eat things.
>
> #weight loss check-in# #exercise check-in# #change your 2020 in 100 days# #diet for weight loss# #bodysculpting with Cool Lady for 100 days# #Yiwa fights with monster# (Hong, Weibo user)

This example expressed her desire to lose weight by tracking meals, sharing weight, relevant lifestyles, and the difficulties involved in controlling the self, as well as fighting the urge to overeat. Despite sharing of failed self-control, the disciplined self was still seen through her digital diary of weight goals, diet, and hashtags. Similarly, Weibo user Kuaikuai felt sad when she lost self-control and ate unhealthily:

> #weight loss# D35. Breakfast: sweet potato + yogurt with no sugar + egg noodles. Lunch: multigrain rice, cabbage, tofu, and stir fry pork with sweet chili sauce. Dinner: dragon fruit + yogurt with no sugar, BBQ tofu, and BBQ sausage. Afternoon snack: orange. Exercise: dance for fat loss for 60 minutes. My air fryer has arrived, so I couldn't control myself and ended up making sausages. Being deeply self-reflective now. [cry][cry][cry] (Kuaikuai, Weibo user, received one 'like')

This post showed the difficulties of maintaining a healthy diet to lose weight. She shared photos of each healthy meal, excluded a photo of the sausages, and shared her exercise data from her Apple Watch. Sad emojis and the hashtag showed that she tried to exercise self-control but failed on that day – only sharing healthy aspects of the self illustrated the effort involved in being a self-disciplined person. Questions here are raised about whether being thin was a symbol of being healthy and how thin individuals need to be to be considered healthy. Weibo users shared how they tried hard to eat less and how upset and guilty they felt if they could not help eating unhealthy food.

The healthy self was also explicitly represented in self-documentation of lives and self-discipline. The theme of healthy identities was identified by cluster 3. Self-tracking researchers have suggested that social media creates interactive spaces for sharing health-related data and content in everyday life (Kent, 2018, 2021). Kent (2021) suggests that healthy identities are represented on social media through health-related self-tracking data (e.g., calorie tracking, exercise monitoring), by photos of the body such as selfies, and images of food consumption. These materials can capture the healthy details and lifestyles of self-trackers in the content shared on social media.

In Chinese medical culture, healthy bodies are related to a healthy and regular lifestyle and habits, healthy food, reasonable exercise and good emotions. As shown in cluster 3, healthy identities were associated with words such as ‘diet’, ‘heart rate’, ‘get up’, ‘walk’ and ‘sleep’ ‘mood’ ‘body’ and ‘period’. These words in posts reflected Chinese health norms. A key topic in Cluster 3 highlighted that Weibo users were trying to lose weight in a healthy and scientific way, with diet and physical exercises contributing to scientific weight loss. For example, Xueting directly shared her attitude towards weight loss:

> I did not exercise for such a long time. It was a bit tiring but feeling sweaty [by running] was great. [Very happy] For me running was an enjoyable progress, but I did not continue to run every day due to the national examination, and after this, I did not start either due to the summer holiday internship and my laziness until recent days. Recently my body feels lighter since I keep running for a few days. It is okay that I cannot lose weight, as long as my body is healthy. [hehe] You are all the cutest, slightly overweight girls. No need to lose weight on purpose. Just do some exercises and the most important thing is having a healthy body. [Very happy] #exercise is persistent# #weight loss# #exercise check-in# @keep [dirty] [dirty] [dirty] Come on everyone, let’s run together! 🏃‍♀️🏃‍♀️🏃‍♀️ #run# (Xueting, Weibo user, received one ‘like’)

Xueting’s opinion on weight loss represented a healthy and self-disciplined self. Running data was seen as a way of being healthy. Careful decision-making on what foods should be shared and excluded in the published content on social media aims to perform health identities, as Kent (2018) argues. As an example, Kuaikuai’s experience, described above, is consistent with Kent’s finding.

Beyond weight loss, exercise was seen as a key way to stay healthy in everyday life. For example, Yao shared her attitude about life and health with a screenshot of her step data:

> Exercise for an hour each day in result of living healthily and working can last for 50 years. Live a happy life in my lifetime. The power of walking let us measure the world. #WeRun# #Exercise Health# 🌏 (୨୧•͈ᴗ•͈) ◞ᴸᵒᵛᵉ ♡ (Yao, Weibo user)

Figure 7.10: Screenshot of running awards on the Huawei Exercise app in Yao's post

The screenshot of Yao's step data showed a history of awards with 18 cards and two medals, and the data history included an average of 16,876 steps a day and 20,781 walked steps produced through the Huawei Exercise app. Walking as a type of exercise was commonly considered by Weibo users and many interview participants as part of a healthy lifestyle. Successful exercise rewards helped to produce an image of a healthy self.

In short, self-trackers explicitly represented the positive sides of themselves in terms of self-discipline and being healthy, through written self-expression, selfies and data relating to achievements. Despite sharing experiences of sometimes losing self-control, instances that recognised failed self-control was another way to project a positive self. Additionally, self-trackers made efforts to lose weight healthily through exercise and diet, but it was unclear what a real healthy body should be and what weight would meet a 'thin' standard.

7.4.2 Implicitly performing the self by sharing achievements through data

Implicitly performing the self also occurs in sharing practices on social media. People hide their pride, happiness and satisfaction about their data from their posts but imply these aspects through screenshots and photos. Implicit identities are expressed in visual content instead of text posts. Some interview participants (such as Hongbin, Zoe, Wen, Xi, Xinyue) often posted about their lives, thoughts, feelings and other random things, which were irrelevant to self-tracking. However, photos and screenshots of self-tracking data that they added below the posts on Moments related to the activities they tracked and the data they produced. The posts often shared positive stories with impressive self-tracking records that they were proud of and represented the positive sides of identities. Some interview

participants (such as Zoe, Hongbin and Xinyue) said that they were motivated to show off on WeChat Moments by sharing self-tracking data. Kent (2020b) found that self-trackers congratulated themselves on Instagram to receive admiration from their community. However, the ways in which interviewees in my research shared attempted to avoid obsessive sharing and to hide their desire for self-representation by simply talking about their lives. As discussed, through Xi's sharing on Moments, her posts made no comment about her exercise data and body, but photos, selfies and screenshots of data implied her pride. In the other example used in Section 7.3, Wen explained her thoughts about sharing her swimming data and life story on Moments:

> Interviewer: Why did you add a picture of strawberries?
> Wen: Because I had some after exercise.
> Interviewer: What was the idea behind posting this on Moments?
> Wen: What I thought was that I wanted to record my life and also let other people know my life. Also, I recorded that I did exercise today on Moments. But I did not want to only share this screenshot of my swimming data to say that I did exercise today. I thought it was really silly that I only posted it to let people know this on purpose. (Wen, 28, female, primary school teacher, repeat interview)

Wen posted screenshots of strawberries to let people know the purpose of her exercise and to represent herself as active, energetic and self-controlled, because she thought it would be silly to directly show the swimming data. She explained what counted as 'silly' and an 'annoyance' to her were those who were obsessed with sharing their self-tracking data every day on WeChat Moments. Showing the strawberry photo was partly about making fun of these posts and made Wen feel less serious and softened her obsession. Also, Wen explained how she selectively shared self-tracking data and her daily routines on WeChat Moments:

> I think the swimming distance is not a big thing that I should be super proud of. Is it necessary to shout about this in my Moments? Anyway, I am not that type of person. I just think that today it is a quite interesting day and also I did exercise which showed I am a self-disciplined person, so I posted it there. But if I swam 1,500 meters and did nothing else during the day, what is the point of purely posting this data? (Wen, 28, female, primary school teacher, repeat interview)

From my interpretation of posts on Moments, data was left out of written text to avoid embarrassment and being perceived as showing off among one's social network. Implicit self-representation was also associated with decisions about whether to share or not and what to share. Many interview participants said that they never or rarely shared their private self-tracking data on social media, but some of them did share occasionally. For example, Yan explained that he preferred private sharing:

> When I first time bought this wristband, I even used it to help others to monitor their heart rate. Like I showed my colleagues, "look, I bought a new wristband and I could monitor your heart rate for you." But later, there were not many people who I can communicate with. Who can I share with? It is not suitable to share with my mum, as she doesn't understand self-tracking. I don't have a girlfriend either. Who else can I

> share with? No one. I don't like to share my data on social media, because my personality is that I like sharing things with people who are very close to me. (Yan, 32, male, developer, initial interview)

This shows that sharing needs audiences and relates to personality; sharing on social media was more concerned with a public space. After his initial interview Yan occasionally shared his cycling data and experiences. For example, Yan shared a screenshot of cycling data showing a 16.54-kilometre distance and described his thoughts about his life:

> Familiar with the road conditions [traffic light]. Repeating routines from beginning to the end [road]. Even more late time to finish work [clock].

Figure 7.11: Yan's post about cycling in the city and working overtime on WeChat Moments (received one 'like' – from me)

When Yan shared, he tended to describe his life and emotions, such as describing his cycling routine in Beijing and complaining about his overtime. His cycling distance was impressive, but not mentioned at all in the text of the post. This is consistent with the last finding about how people implicitly express their selves. Additionally, different types of self-tracking data are shared on Weibo, but for many interview participants their data was considered to be inappropriate for sharing in public on social media. A few interview participants suggested that they selectively controlled what to share and not to share on social media. For example, Hongbin decided to only share things in relation to physical exercise:

> I don't share about my weight, which is quite sensitive. In general, I mainly share about skiing such as distances and photos. If I track cycling, I also share distances and cycling routines to show people how excellent I am. (Hongbin, 31, male, self-employer, initial interview)

Consider what data could be shared with others publicly, given its sensitivity and privacy. Most interview participants said that they never shared self-tracking on social media; they preferred to share privately on their devices and apps, on paper, and in other places. Rettberg (2014) notes that most self-trackers keep their data private or carefully share some of it,

although devices and apps encourage them to share their data to social media. However, many had experienced this type of sharing before or after interviews. They felt compelled to say that they did not share, exhibiting a reluctance to do so, even though sometimes they actually did.

The implicit aspect of sharing can be seen from styles of sharing on both platforms. Examples given in this chapter suggest that sharing on Moments usually involves short versions of content that tends to be positive. Weibo users seem to have more freedom to share broader stories which could be short descriptions that are similar to posts on Moment, as well as long storytelling, positive or negative, or random narratives, such as interesting life events, complaints about self-tracking devices and apps or issues happening in everyday life. Therefore, when interview participants shared their lives and experiences in relation to self-tracking, they considered whether they were sharing the right things, in the right way – to not look silly and obsessive. This showed that participants tended to approach sharing cautiously. Also, the accounts of reluctant and careful data-sharing practices explains why some interview participants (such as Wen and Yan) shared positive aspects of themselves implicitly. The rules of social media platforms influence the forms of self-representation. The differing data-sharing practices of Weibo users and interview participants relate to the distinctive nature of both social media platforms in terms of privacy settings and relationship with audiences.

This section showed how people represent themselves in explicit and implicit ways on Weibo and WeChat. People on both platforms performed self-discipline, the active self and the healthy self. In addition, the analysis suggests potential differences between how interviewees and Weibo users shared about their self-tracking. Interview participants who posted their data on WeChat's Moments often communicated their identities implicitl through what they talked (or did not talk) about their experiences and data. While some Weibo users in this study shared implicitly, most spoked directly about their achievements, failures and other experiences in relation to self-tracking data.

7.5 Voluntary and Resistant Communication in Sharing Data Practices

Documenting life and performing the self on social media also involves communication. The previous two sections demonstrated how self-trackers communicate with imagined audiences. Self-tracking researchers have often discussed self-tracking as a form of communication (Lomborg and Frandsen, 2016; Sharon and Zandbergen, 2017). In a study of self-tracking as a way of communicating and narrating personal stories, Sharon and Zandbergen (2017) point out that data are used as a way to share detailed, intimate stories with other people, and the method of sharing these stories provides personal interpretation and contextualisation of experiences of making sense of data and data visualisation. This section moves to social communication with other people by sharing self-tracking data, particularly in person in everyday life, as not all sharing and communication happens on social media. Weibo’s social functions, designed to increase post visibility and the possibility of communication, did not

seem to happen among Weibo users in this study. Most posts on Weibo discussed above as examples showed a common feature: these kinds of Weibo posts in relation to self-tracking rarely received 'likes' and 'comments', although several posts received two or three social reactions. It is understandable that replies to posts on Moments on WeChat were negligible, due to its privacy settings, whereby social interactions on Moments are only visible between people who were friends with each other.

Therefore, this section explores communication through sharing data on both platforms and draws attention to online and offline communication in public and private sharing practices. I argue that sharing data privately with friends, family and colleagues in private group chats on WeChat and face-to-face or one-to-one sharing is important for maintaining *guanxi* (关系). In Chinese culture *guanxi* means that people gain benefits by sharing responsibilities and cooperation (Yuchun, 2006). In the context of sharing self-tracking data, *guanxi* involves intimate relationships with friends, family and partners as well as *guanxi* with colleagues and strangers in the industry. Debates in digital media studies about sharing do not often recognise offline sharing. However, sociologists such as Weiner and colleagues (2020) have found that people do share offline at home. I also found that people share self-tracking data offline and this was deeply tied to why they did or did not share online and what role sharing data plays in social communication. Many Weibo users and interview participants shared their data and communicated with other people including on social media and offline, and with strangers, social networks, partners, family members and friends. This study contributes to debates in the sociological field to emphasise the complex, unseen communication involved in sharing self-tracking data in China. Sharing data in this study involved how people dealt with relationships with family, partners, and friends, and reacted to *guanxi* with colleagues.

7.5.1 Active participatory social communication with audiences

In this section, I address social communication, which I understand as online communication with imagined audiences and specific audiences on social media and offline communication through dialogue. Social communication on social media was occasional in this study, although sharing was an attempt to communicate with people in the first place. This finding challenges existing arguments in social media studies that people share information and emotions to form social relations with other users (John, 2013a) and to communicate with others (Carr and Hayes, 2015; Russo et al., 2008). Weibo posts in this study received little attention from their audiences. Social interactions within interview participants' posts were invisible to me, as we had no shared friends on WeChat. As mentioned in the last two sections, Hongtao's post received one comment and posts published by Di, Yu, Bixia, Kuaikuai, and Xueting each received one 'like'. Interview participant Wen commented on her own post to to arrange a swimming plan with her colleagues, although their replies were invisible to me due to privacy settings on WeChat. It was clear that most public posts on Weibo and WeChat received few 'likes' and 'comments'. As this study targeted ordinary self-trackers, these Weibo users were less popular than those whose accounts were verified.

However, language and functions used in Weibo posts represented people's willingness to engage in communication with peers and broader audiences on Weibo. Central words in cluster 1 (such as 'together' and 'come on') and original Weibo posts such as the examples discussed earlier revealed that Weibo users tended to encourage their audiences to self-track and participate in activities and achieve goals together. For example, the words 'everybody', 'everyone' and 'together' were found alongside words such as 'weight loss', 'come on', 'eat', 'you' and 'friend'. This suggests that Weibo users hoped to self-track with friends and other users and participated in challenges with them together. Additionally, Weibo users communicated to their imagined audiences through functions on Weibo such as hashtags, '@', '💎', emojis, 'like', and 'comment'. This links to John's (2013b) argument that social network sites implicitly encourage people to share both nonintimate and intimate information.

For example, language used by Xueting ("Come on everyone" and "You are all the cutest… girls") sounded like she was talking to an audience who had the same goal of weight loss as her, and she encouraged them to run together. It also included emojis to express positive emotions about the joy of running, the importance of being healthy, and an active identity. People share emotions to form intimate relations with other users (John, 2013a). This post was a typical example of how self-trackers tried to communicate with others in communities such as weight loss groups and running groups, by using emotive language, emojis, hashtags and the "@" function. Sharing self-tracking practices aimed to instigate conversations about experiences and engagement with devices, apps and data and extend their sense of data. As the only interview participant who shared self-tracking data on Weibo, Zoe explained why she shared sleep data, even though she barely received any 'likes' or 'comments':

> I think I just simply send a signal to the public, to the outside of the world to see who can receive it. It is the social nature of human beings. (Zoe, 27, female, Internet employee, history of depression, initial interview)

During the interview Zoe recounted that she aimed to gain attention from people who had the same interests as her, by sharing things such as self-tracking sleep data, weight loss and fitness, or continuing to write dairies in the morning, on both WeChat and Weibo. Due to a lack of response from her audience on Weibo, she eventually decided to stop sharing data there. This could be a factor to explain the finding around sharing and documenting lives being intermittent (see Section 7.2).

Previous research suggests that self-tracking data was also used as a communication aid to enable expressions of body conditions and subjective and objective experiences of diagnoses, physical health, and illness (Fiore-Gartland and Neff, 2015; Kamphof, 2016; Sharon and Zandbergen, 2017). This was reflected in this study in terms of communication about health and illness. For example, Feifei's post about her menstrual cycle generated comments from several users. Feifei posted about the possible relationship between her menstruation cycle and carbohydrate intake, and she used carbohydrates to experiment with whether her period would come on time:

> Looking forward to this! The software suggests that my period aunt will come in 4 days. I make a lot of efforts to eat food, containing carbohydrates during this month. If [my period] can come on time this month, it means that [previously] it [the abnormal period] was really a problem with [lacking] carbohydrates. (Feifei, Weibo user, received six comments)
>
> This post led to the following comments:
>
> Comment 1:
>
> - The reason why aunt doesn't come on time is that [your body] had much less fat…
>
> - But seriously I take a lot of meat and fat. (Feifei's reply)
>
> - Sigh…
>
> Comment 2:
>
> - I want it [my period] to come after Thursday, and I hope my period aunt could listen to me.
>
> - I hope so. I also hope mine comes a bit later. (Feifei's reply)
>
> Comment 3:
>
> - Today I eventually [have my period]… It is extremely painful.
>
> (No reply from Feifei to this comment)

This example was different to the examples shown above, which rarely received comments. This post described tracking a menstruation cycle and developed a conversation in the 'Comments' section around this topic and exchanged some reasons for a delayed period. Communication through comments showed peer support for body management, particularly periods. Also, some posts sought advice about technical issues in relation to devices and apps, seeking recommendations and asking for help.

Different to public sharing, unseen social communication happens privately on social media within private group or individual chats. Private social communication benefited from encouragement with continuous self-tracking, improving skills and maintaining friendships. For instance, interview participant Jiankun encouraged other self-trackers to try different forms of exercises by looking at their posts on WeChat Moments. As mentioned in Chapter Five, interview participant Ying often discussed her periods with her friends when they planned to travel together, which contributed to building their friendship.

In short, a clear pattern was shown in this section whereby public posts rarely received comments and likes on Weibo. Compared with macro and micro influencers on Weibo, posts published by ordinary Weibo users usually receive little attention from the public. A few posts gained attention from users on Weibo and opened opportunities to communicate about

not only self-tracking but also a range of other topics from everyday life. However, social communication was commonly conducted privately on social media.

7.5.2 Communication in intimate relationships

Self-tracking data can become a form of intimate communication between couples. Weibo users and interview participants discussed this. Public Weibo posts often described male partners voluntarily downloading fertility trackers on their own mobile phones to help take care of their partners around their period. For example, Weibo user Huahua shared an intimate story of how her boyfriend surprisingly downloaded a fertility tracker to remind her not to eat cold food to avoid period pain:

> I always love to eat cold food, which causes pain every time when my period comes. Today I notice that he even downloaded a fertility software 😂 for me to remind me not to have cold things before my period comes. It is so sweet. (ps, the reason why I record sweet things here that he did for me in the past is not to immediately break up with him when we argue in everyday life 😂. (These recordings of sweet stories he did for me on Weibo can remind me that) we love each other, after all. 😂) (Huahua, Weibo user, received one 'like' and one 'comment')
>
> - Comment 1: humph humph humph

The example shows that data in relation to the menstruation cycle was used to make a couple aware of when the woman's period would come and to provide opportunities for her partner to know more about her body. Many interview participants also shared the same apps on their phone as their partners. Three participants, Xi, Ying and Yiyi, shared their weights with their partners to remind each other to maintain healthy lifestyles or to monitor weight loss. Hongbin and Xinyue shared their exercise data with their partners as a way to express their desire to spend time together. Two participants shared their menstruation cycle data with their respective partners to gain support from them. For example, Xi's boyfriend reminded her to check her menstruation cycle date on the PinkBird app to see if her period had come whenever she showed negative emotions. She shared fertility data and relevant knowledge recommended by the app with her boyfriend. Xi explained the reason for sharing this data:

> By sharing the period dates and knowledge, I want him to understand my emotional changes better and learn the knowledge and then remind me of what I should do to take care myself around the period time. I feel like that I get more attention and care from him. (Xi, 25, female, marketing officer, history of depression and eating disorder, repeat interview)

Similarly, Pang and her boyfriend both downloaded the Clue app and shared her account on their individual mobile phones – she synchronised her fertility data to this account. She actively shared the symptoms of her periods with her boyfriend when she suffered pain and was affected by her periods:

> It seems that I don't have a specific purpose to share these things. I just want to talk about my situation with my intimate person. For example, I tell him that I am really uncomfortable and have bad cramps during my menstruation. (Pang, 28, female, assistant lawyer, history of depression and cervical polyp operation, initial interview)

Yiyi had a different opinion to Xi and Pang. As a professional officer in the Internet industry, Yiyi knew how technology companies promoted their software products. She made comments about sharing the same account on the fertility apps with partners. She said that this was a commercial gimmick to attract more people to use this type of app, and she might consider sharing the app with her partner in the future when she got pregnant. Sharing data could attract attention, care and comfort from intimate relations. Three participants also shared their weight and physical activities with their friends and relatives. For example, Yiyi wanted to comfort her boyfriend and help him be less anxious, so she shared her weight data to show she had put weight on as well (Yiyi's initial interview). Yiyi shared her delayed menstruation dates, symptoms, and anxious feelings with her female colleague, and they comforted each other every day until both of their periods came.

However, sharing data can increase arguments and pressure between couples. For example, Lili shared a sad offline story about how she found about fertility tracking software for the first time:

> The first time I found about the Meetyou software that recorded women's menstruation cycles was when I saw it on my husband's mobile phone. But the dates he recorded were not mine. ~~ Things like this happened quite a lot as a result of having no nice memories of our relationship. But everything happened because I chose this (wrong) man and then (I had to experience) all of these things. So it is my fault.

This shows that allowing partners to check mobile phone is a form of open communication, but in this story the period data destroyed trust between the couple. Xi and Yiyi also noted that they and their partners all felt pressure from each other by talking about their weights.

In summary, these examples show how communicating data allowed people to maintain intimate relationships. Communicating about self-tracking data such as menstruation cycle and weight with partners can provide self-trackers with intimate support. When they faced difficulties such as anxiety, pain and confusion about their body and data, sharing the self-tracking experiences and data was a powerful way to gain or offer empathy to and support each other. Self-tracking practices become a form of intimate surveillance (Will et al., 2020) to monitor partners as a way of showing love and taking care of others, but it could lead to issues with privacy and increase tension between partners.

7.5.3 Communication in family life and friendships

Family relationships, as a different type of intimate surveillance that some participants experienced, had an impact on self-tracking activities in terms of weight and steps. Many

interview participants allowed WeChat to automatically collect and share their step data on WeRun. Some aimed to maintain close relationships with family members and friends, especially among self-trackers whose relatives lived in other cities. For example, Pei lived far from his family, and he liked to share step data on WeRun with elder family members:

> My uncles retired from work, and they felt like losing attention from people. Giving likes to their step ranks can make them happy and feel respected. (Pei, 35, male, video coding developer, history of shingles, initial interview)

Living far from parents and family members can reduce opportunities for communication between them. Participants lived in a big city, Beijing, and normally only returned to their hometown once a year. Sharing and liking step data were used as a bridge to show the participants' respect for elderly family members and to let them know they were not forgotten. Chinese scholars have noted that expressions of contemporary Chinese filial piety include the respect of children to parents and elderly family, daily maintenance, sickness care and financial support (Chan and Tan, 2004; Ho, 1994; Zhan and Montgomery, 2003). Thus, when living in different cities, giving respect and attention to parents and other family members by 'liking' step rankings was a type of emotional compensation. Some participants such as Pei and Ying tried to keep in touch with their parents and family members, especially since they lived far away from their family and decided to leave their WeRun function on, even though they might not necessarily track their own steps. Doing so gave their family access to their daily lives. Other participants living with their family or in the same city were not interested in tracking; their decisions on what and how to track were independent of family influence.

However, discussion about body and data with family could lead to unfair judgements, potentially hindering communication. Parents' attitudes sometimes affected self-trackers' activities. For example, Yingyue's parents had a "standard body shape" (Yingyue, 22, female, undergraduate student, initial interview) and they judged that her body shape did not meet a socially acceptable size, which annoyed her. She was concerned about her weight around her parents, even though she did not consider herself to be overweight. Therefore, she preferred to track her weight without her parents' knowledge. However, other participants' self-tracking experiences did not relate to intimate observations, as there were no intimate or loving relations and family relations involved in their practices.

Communicating about self-tracking data can help maintain friendships. For example, Zeyu talked about his step data with his roommate when they were lying in bed: "It can enhance our friendship when we talk about our steps" (Zeyu, repeat interview). Pei explained how he started a conversation with friends: "Some of my friends share their running data on WeChat whenever they track their running activity. Then, we have a chat about it" (Pei, 35, male, video coding developer, history of shingles, initial interview).

7.5.4 Communication in the workplace

A fitness tracking study (Gui et al., 2017) found that sharing step data with social networks on WeChat motivated people to keep tracking steps and developed existing social relations. In my study, friends and colleagues talking about self-tracking data offline with each other was a way of starting social interactions. For example, Tiyu discussed issues about weight loss and daily step data with friends and colleagues at school when they met up (Tiyu, 48, male, middle school PE teacher, initial interview).

Liking steps on WeRun was another way of demonstrating respect to bosses in the workplace. The term *guanxi* in the context of sharing self-tracking data is related to currency and hierarchy in relation to the workplace, particularly on WeRun on Moments. Some participants such as Wen and Xinyue communicated with colleagues to build their relationships. They liked the step rankings of their colleagues and bosses on WeRun. The number of 'likes' on their step data on WeRun and posts on Weibo related to how much attention the self-trackers received. Some self-trackers understood a 'like' as a way of developing social relationships for their business and social networks. As shown in Figure 16, Wen replied to her colleagues' comments and showed her willingness to swim with them. Similarly, Xiao sometimes received 'likes' from a businessman who aimed to maintain a relationship with Xiao by liking his step data.

However, in this study many interview participants were fed up with having to deal with *guanxi* among managers and resisted building *guanxi* on WeChat. Most participants turned off their notifications on WeRun and only a few paid attention to notifications from their mobiles when their friends liked their step data on WeRun on WeChat. Some even turned off the function to share step data on WeRun or set up privacy settings to filter the audiences for their data on WeRun and posts on WeChat Moments. For other participants, liking step data became an obligation and form of currency, and a way of securing jobs. They reported that they felt like they had to 'like' their boss' WeRun data to show their respect and support. For example, Lele had to 'like' his supervisor's step data, and he did so every day.

This section discussed how self-trackers are willing to communicate with their audiences on Weibo and WeChat. Sometimes they discussed things through 'comments', but this phenomenon rarely happened among Weibo users in this study. Sharing becomes caring that enhances intimate relationships between self-trackers and their partners and families, but it might also lead to unhappiness and a ceasing of communication. Also, voluntarily sharing data can benefit the development of relationships and *guanxi* with colleagues. However, although social media became a tool for *guanxi*, it was not for everybody – not everyone built up or resisted *guanxi* by sharing data. This represented behaviours of resistance to communication through data. I found diverse sharing practices in which self-trackers dealt with *guanxi* by responding to self-tracking step data in different ways. Sometimes, people's attitudes changed from willingness to reluctance to communicate, due to intimate and social surveillance.

7.6 Discussion and Conclusion

The three themes explored in this chapter were driven by data identified in three clusters and thematic analysis of original posts and interviews. The chapter explored what and how people shared on two of the most popular Chinese social media platforms, Weibo and WeChat, as well as through offline means. The chapter also briefly presented why people shared or did not share. Both Weibo users and interview participants treated sharing data practices as opportunities to share their daily lives, represent the self and communicate between the self and other people, although some differences appeared between their sharing.

Section 7.3: "I share my life, not my data", discussed how most shared content concerns people's everyday lives, experiences, thoughts and feelings. Clusters 1 and 2 showed that people shared various aspects of their lives in relation to diverse types of self-tracking data. In combination with qualitative analysis of posts included in the semantic network and interview participants' posts, the chapter further explored what and how people shared. The first finding was that sharing self-tracking data was an important aspect of sharing but not the central part of posts on both platforms. Weibo users used the platform as a space to write digital diaries and share their lives in detail, showing a range of different positive and negative aspects of their lives and experiences. Interview participants usually wrote relatively short life stories which were used to store memories on Moments on WeChat, which they could recall in the future. The second finding was that sometimes methods of self-documenting were also brief but detailed on Weibo. The third finding was that self-documentation of lives and data tended to be intermittent on Weibo and on Moments on WeChat for different reasons. This section discussed how data was an important part of people sharing their lives.

Section 7.4: Explicit and Implicit Forms of Self-representations discussed self-representation through data and sharing of data on social media. The theme in cluster 2 showed a disciplined self and cluster 3 represented a healthy self through sharing on Weibo. Through combing two themes in clusters 2 and 3 with the thematic analysis of posts and interviews, I argued that within the content of documenting life and broad posts on both platforms, self-trackers used their self-tracking data and shared content to construct their identities both explicitly and implicitly. The first finding was that people explicitly represented an active, disciplined, and healthy self through sharing textual and visual content in relation to exercise, diet, food, sleep, periods, work and body shapes, particularly on Weibo. They aimed to motivate themselves to achieve goals, develop a healthy body, and live a healthy lifestyle. Weibo users showed their pride in themselves in a funny, exciting and confident manner. Although sharing on Moments on WeChat was also public, it was relatively more private than sharing on Weibo. This dictated the meaning of sharing as communication was different on each platform. Although interview participants also represented such identities by sharing self-tracking data, they carefully showed data and ideas on Moments on WeChat in a more implicit way. Some interview participants implicitly performed identities and achievements by avoiding talking about their data in the text of their posts, instead showing successful data in visual content (e.g., selfies, photos and screenshots of data).

Section 7.5 discussed how people communicated with others by sharing in different contexts within their everyday lives, including public social communication on social media, in intimate relationships, in family life and friendships, and in the workplace. This was different from communication with the self in the form of self-documentation and self-representation. I argued that self-trackers voluntarily and reluctantly communicated with others, and both forms of communication changed based on personal sharing experiences. The first finding was that the public sharing practice on Weibo potentially aimed to communicate with those who had similar interests and experiences, but rarely attracted social interactions between self-trackers and their public audiences. It was unknown how much attention posts on Moments attracted from interview participants' public audiences, due to the privacy settings on the platform.

The second finding was that offline communication between partners about self-tracking data, particularly relating to weight, steps and menstruation cycle, could help retain their intimate relationships but also ran the risk of increasing tensions and pressure. I found that interview participants understood the sharing of data as a form of filial piety by sharing step data in private group chats on WeChat or 'liking' step rankings on WeRun. They aimed to demonstrate their respect and willingness to maintain family relationships in the way they communicated their data. Finally, I discussed how sharing involved currency and hierarchy in the workplace by liking colleagues' and managers' step data rankings on WeRun – this benefited social relationships within companies and sometimes led to resistance to communicate with colleagues in this way.

Chinese culture emerged in discussion on sharing on both social media platforms. Sharing the same accounts and data with partners was regarded by Weibo users and interview participants as a way of showing love and care for each other. It also showed what healthy food, healthy diet and a healthy lifestyle should look like, echoing Chinese medical culture. Despite having such knowledge, the posts showed many Weibo users felt pressure to maintain healthy strategies for weight loss and a healthy lifestyle. The other contribution of self-tracking in China was that sharing as communication was used to develop and maintain *guanxi* among intimate relationships and colleagues in the workplace – a new finding in the field of self-tracking scholarship.

This chapter answered the third research question and explained the meaning of data in the context of sharing and communication. I argue that understanding the meaning of self-tracking data should consider the relationships between data and everyday life and relationships and listen to self-trackers' own interpretations of their data. Sharing on social media is a powerful way to explore these subjects.

Chapter 8 Conclusion

8.1 Introduction

The overarching aim of this research was to explore Chinese people's self-tracking experiences, which are missing in the existing literature on self-tracking.

The research aimed to answer four research questions:

> **RQ1**: What differences matter in Chinese self-trackers tracking activities?
>
> **RQ2**: How do Chinese self-trackers feel about their different self-tracking practices and data?
>
> **RQ3**: How do Chinese self-trackers share and communicate about their self-tracking practices? What do they share and communicate?
>
> **RQ4**: Do themes (identified in the literature review) apply in the Chinese context, or do new themes emerge? How do the findings relate to current scholarship?

Driven by these four research questions, the study focused on three aspects of self-tracking in China: diversity, feelings and sharing about self-tracking. This conclusion will summarise the main findings of the research, relating these to my research questions concerning differences, feelings, and sharing. Finally, I discuss future research possibilities and the limitations of the research.

8.2 Findings in Relation to Research Questions and Academic Contributions

8.2.1 Differences in self-tracking practices

Chapters Four and Five focused on the first research question and examined differences in everyday self-tracking practices in China. Both chapters looked at different types of self-tracking technologies and individual experiences rather than just one. They demonstrated that differences in digital self-tracking practices relate to features, personal lives, different and creative uses of the technologies and features, changes in self-tracking, and Chinese contexts. Chapter Four summarised self-tracking technologies, their functions and features, and participants' motivations for using them. This chapter aimed to provide the context to help understand the differences in self-tracking presented in Chapter Five. This overview showed the different activities people tracked, the various devices and apps that people used, their features and people's different motivations for self-tracking. This key finding answered the first and fourth research questions. In recent years, self-tracking scholars (Lupton and Smith, 2018, Weiner et al., 2020) have begun to note that people track multiple things through self-tracking technologies and that they do so in different ways. My findings highlight the

phenomena that intersect to produce these differences – technologies, activities, everyday lives, different ways of engaging with the technologies and Chinese contexts all combine in different ways in each self-tracking moment. In short, individuals used the same apps/devices in different ways; each person tracked different things using different technologies over different time periods; and these differences were tightly linked to personal mundane lives and Chinese contexts. This finding advances existing scholarship by exploring variations in self-tracking practices in terms of diverse types of self-tracking data and various aspects of everyday life in relation to self-tracking.

The second key finding in Chapter Four was that there are similarities and differences between Chinese and Western self-tracking technologies. In China, both national domestic and foreign devices and apps were widely used by participants, while Chinese self-tracking technologies are rarely used in the West. The well-known technologies participants commonly used included Apple Watch and its apps (such as Apple Health), Huawei and Xiaomi's self-tracking products, Keep, Mint and WeRun. Other devices and apps, including Western technologies, were used less frequently by participants but remained popular in the Chinese market.

I found that self-tracking technologies provided not only self-tracking services but also life services such as payments, phone calls, messages, healthcare, and music. Therefore, I argued that self-tracking technologies are becoming part of the infrastructure of everyday life in China, in the same way that WeChat has, as a mega-platform integrated into ordinary lives. Another self-tracking phenomenon specific to China was that some of these devices and apps had official accounts on WeChat that allowed people to engage with self-tracking data through the platform and to synchronize their exercise-related data as step data, which showed in the daily step ranking list on WeRun. As such, I suggest that not only is self-tracking software becoming more comprehensive, but it is also linked into the super-platform WeChat, meaning that self-tracking is thoroughly embedded in the digital infrastructure of everyday life in China. Some leading Western self-tracking devices and apps, such as Apple's self-tracking products, also demonstrate this trend of developing comprehensive applications. However, it is uncommon for these to connect to super apps such as WeChat and attempt to be embedded in the digital infrastructure of everyday life.

Chapter Four ended with a brief summary of the main motivations for self-tracking. Four types of self-tracking motivations were observed: health management, development of good lifestyles, monitoring bodily symptoms, curiosity about devices and apps, and receiving rewards such as money through gamified self-tracking. Most motivations have been identified in existing literature, but receiving money as a reward is a new finding. One participant earned pocket money by walking a certain number of steps each day on JoyRun, receiving it through WeChat Payment. As with self-tracking practices themselves, motivations for self-tracking are also diverse. This finding demonstrates how people track differently and helps answer the first research question.

Chapter Five moved to a discussion about how people's everyday lives shape uses of these technologies and their features for self-tracking. This chapter focused on differences in terms

of people's uses of the technologies and their features, changes in self-tracking practices and the role that the Chinese context plays in how my participants self-tracked. I argued that the intersections of all these factors were not settled – they were fluid, dynamic, and changing. I argued that who individuals were, what they experienced in their everyday lives, and their needs all affected what self-tracking they did and how they used tracking.

The narratives obtained from interview participants suggested that participation in daily activities (including exercise, sleep, and weight management) required time investment and effort, and self-tracking also needed people to have the right headspace, energy and time to be actively engaged. However, mundane life routines occupied people most of the time, and informed different ways of self-tracking. Mundane life in this study included work lives, domestic life including married life and intimate relationships. People who lived in Chinese cities were often busy with work as part of the Chinese 996 work culture, and work routines strongly affected whether, when, what and how to track. Some people began to rely on passive automatic self-tracking and only reviewed their data whenever they had time. This work culture stopped some people continuing to self-track some of their activities, either temporarily or permanently. However, those who worked flexibly and had a good work/life balance could invest time in self-tracking. An exception was found whereby difficult working conditions, in deserts and oceans, motivated participant Lele to self-track regularly in everyday life to prepare his healthy self to adapt to such hard-working environments in the future. Thus, fitness and good health became occupational necessities for him.

Domesticity in terms of married life and intimate relationships interrupted self-tracking practices. Married life required participants to take responsibility not only for themselves but for their family too. They invested time and energy in earning money and taking care of children and family members. This shifted their attention from the self and self-tracking to other routines. Some people selectively gave up using certain devices and apps, especially those that needed people to actively engage in self-tracking, such as wristbands and the Keep app. Others made efforts to stick to self-tracking whenever they could but changed their frequencies and ways of self-tracking and viewing the data to adjust to married life. Adjustments made in self-tracking practices were often based on family members' routines such as children's schedules or partners' work situations. Some people maintained their intimate relationships by self-tracking together with their partners. They regarded self-tracking as not only intimate surveillance but also a way of showing love to each other. The intimate aspect of self-tracking can limit self-trackers' willingness to let their partners participate in their self-tracking practices, especially when partners added pressure, control, and inconvenience through intimate surveillance of their individual self-tracking routines. Self-tracking alone made people feel free to follow their own routines, which was different from tracking with partners. Thus, everyday self-tracking was closely related to life routines. Self-tracking practices can easily be influenced by real-life concerns and issues. When new schedules were incorporated into everyday life, people had to adjust their self-tracking to fit new life patterns. In contrast, tracking dates and symptoms of menstruation cycles was used to schedule daily lives, such as whether and when to have spas with friends or register an

examination. This was because stability of tracking periods came from inside the body, and tracking patterns were not immediately affected by things happening in everyday life.

The third finding was that people used three common features – notifications, goal setting, and gamification – differently and used other features of self-tracking technologies in creative ways. Notifications connected to sensors were designed to draw self-trackers' eyes to the technologies and data and motivate them to self-track. Participants used different methods of checking notifications such as from the overall notification list of mobile phones, or notifications from the individual self-tracking devices and apps they used. A new way of receiving notifications that was unexpected was that a participant synchronised her self-tracking accounts on the official platforms of these technologies on WeChat. Other participants synchronised all exercise-related data that was produced through these self-tracking devices and apps as step data on WeRun. In this way, self-trackers received all notifications about their various self-tracking data that was produced through devices and apps from their official accounts on WeChat or WeRun. Some people used synchronisation of self-tracking data across different digital technologies to set up notifications. Moreover, seasonal and environmental differences such as the COVID-19 pandemic, fluctuations in climate over the seasons and Chinese medical culture all influenced how Chinese people self-tracked differently to people in the West, according to existing self-tracking studies.

The findings above suggested that different devices and apps and different activities in different personal lives were interrelated. The Chinese context was also a factor in these differences. Differences in everyday self-tracking practices suggests that people have agency to adjust self-tracking routines to fit into their everyday lives. They use their devices and apps to meet their own needs. My findings thus contribute to debates around user agency in self-tracking that suggest data is not always important – how individuals interpret and use their personal data matters. This is because their diverse subjective living experiences and understanding give meanings to data and self-tracking (Danesi et al., 2018; Kristensen and Ruckenstein, 2018; Lupton and Smith, 2018; Sharon and Zandbergen, 2017). Also, meanings of self-tracking practices and data are contextualised in the mundane life (Pantzar and Ruckenstein, 2017) and "uncertainties, complexities, and contingencies" (Lupton and Smith, 2018, p.67) are flowing in day-to-day life. When people encounter self-tracking data in their complexed mundane lives, their diverse thoughts, attitudes, feelings, and behaviours shape these differences in practices.

My findings also contribute to debates about the significance of everyday life in how people understand and live with self-tracking data. My findings illustrate the extent to which self-tracking is embedded in everyday life. As discussed in Chapter One, studying everydayness is important for understanding individuals' experiences, thoughts and feelings in everyday life within cultural contexts (Bennett, 2005; Kalekin-Fishman, 2013; Scott, 2009). Exploring Chinese self-trackers' mundane lives such as work and family life and the relevant Chinese cultural contexts helps with understanding how Chinese people fit self-tracking technologies and their data into their day-to-day lives.

This research also provides an approach to studying differences in various self-tracking practices: looking at self-tracking broadly as an everyday practice rather than narrowing it down to focus on one single technology or type of self-tracking activity. As the self-tracking phenomenon is embedded in changeable and complex everyday lives, it involves many variations in everyday self-tracking practices from types of technologies and data to people's lived routines. Focusing on one app or type of tracking activity simplifies hidden variations and is unlikely to represent broad self-tracking practices.

8.2.2 Feelings about self-tracking

Chapter Six was concerned with feelings about self-tracking, addressing the second main research question by looking at self-trackers' feelings towards their bodies, devices, apps and data, and sharing in the context of self-tracking. It showed that self-trackers' feelings emerged in relation to their bodies, different types of self-tracking activities and different types of metrics (statistics and data visualisations). Their feelings were intertwined with these aspects of engagement in self-tracking practices, and they worked together to influence how people used the technologies and made sense of and used their data. This finding answers the second and fourth research questions and was inspired by scholars who study feelings and data (Kennedy and Hill, 2018; Lupton, 2017; Pantzar and Ruckenstein, 2017; Ruckenstein, 2014). This chapter extended the work of Kennedy and Hill (2018) and Lupton (2017). For Kennedy and Hill (2018), 'feelings' relates to emotional responses towards data and data visualisations. Lupton and her co-researchers (2018) investigated sensory feelings (from digital sensors built-in to devices and apps), embodiment and emotions in digital cycling self-tracking data practices. I combined both definitions of feeling and understood it to refer to both bodily sensations, emotions and sensory feelings, which sometimes trigger each other. Self-tracking scholars such as Lupton, along with recent ethnographic studies (Weiner et al., 2020), have tended to produce evidence about bodily feelings and emotions in relation to one type of tracking such as weight, blood pressure, or cycling. Unlike existing literature that often focuses on only one type of self-tracking (Lupton, 2017; Levinson et al., 2020; Pritz, 2016; Costa Figueiredo et al., 2018), examined different types of self-tracking, and how they produced, heightened or diminished feelings in different ways.

The first finding in Chapter Six was that some tracking activities in relation to physical bodies evoked bodily sensations and emotions. Self-tracking weight and menstruation cycles evoked the strongest feelings, but people reacted to these two different types of self-tracking in opposing ways. This finding is new to the literature, as previous studies separately discussed feelings about weight and menstruation cycle. By looking at them together in this study, it demonstrates that feelings about self-tracking are not always the same. That is, how people feel depends on specific contexts (Pantzar and Ruckenstein, 2017). Tracking weight could trigger bodily sensations from fatness, heaviness and lightness to happiness, satisfaction, and relief. Most of these feelings in tracking weight-related data have been studied in existing research (Niva, 2017; Weiner et al., 2020), except for heaviness and lightness that this study brought to the scholarship to demonstrate how Chinese self-trackers

expressed their bodily sensations differently. Positive feelings encouraged people to continue tracking their weight and to even weigh themselves more often. However, lifestyles that increased weight along with negative feelings led people to avoid viewing weight records, as people were anxious about being heavier. By not tracking, people can help to avoid disappointment, which has been suggested several existing studies (Weiner et al., 2020; Costa Figueiredo et al., 2018; Lee and Hong, 2017). For example, in previous studies (Lomborg and Frandsen, 2016; Spotswood et al., 2020), people who tracked their runs decided not to track on particular days because it was too emotionally loaded, and they would fail. Or it was too much data to manage, and they found it emotionally overwhelming.

The second finding was when menstruation cycles were about to begin or in the first two days, female participants' bodies felt abnormal, uncomfortable, sore, and tired and their breasts and ovulation might feel painful. As soon as these discomfortable bodily sensations appeared, negative emotions usually emerged too. Most female participants who tracked periods explained these feelings in relation to premenstrual syndrome. These feelings reminded people to reflect on previous data to predict whether these feelings meant their period was imminent. During menstruation, some people carefully recorded these feelings as evidence for future predictions. People paid close attention to feelings and data histories when they had obvious bodily sensations and negative emotions such as anger, unhappiness and sadness. Although previous work has suggested women's emotional burden in relation to periods (Costa Figueiredo et al., 2018; Grenfell et al., 2021), the scholars argue that women treated their emotions around periods time as guilt, self-blame and embarrassment. However, in my study all of my female participants were confident and comfortable to describe their negative emotions. This is related to the mainstream Chinese medical culture that Chinese male and female people regarded this as the ordinariness in the society. As the participants Yiyi and Xi mentioned, people felt comfortable to talk about periods in China and it was normal to communicate it with partners, but it appeared to be a bit unusual in the UK. Besides, a delayed menstruation cycle increased negative emotions such as worries, stress, and confusion, which were often related by female participants to possibly being pregnant or having an illness. Stressful personal and work lives sometimes delayed some participants' periods as well, which worsened their feelings. Such delays motivated them to more frequently view their data, while viewing data made them even more worried and anxious. When their period eventually came, people felt relieved and happy again. Therefore, bodily sensations, emotions and changing feelings drove self-trackers to question themselves and to carefully track menstruation cycles and review the relevant data.

Therefore, I argued that how people felt about data depended on what the data told them, sometimes leading to higher trust in one's body than in the data. Data reflected embodied sensations that stirred people's emotions. Digital self-tracking data helped people to reflect on their bodily sensations and triggered their emotions. Sometimes data had agency that overrode their embodied sensations and emotions in favour of what the data said. For example, when interview participant Pang felt heavier, but data told her that her weight had not changed, she believed the objective information that the data told her.

The third main finding was that feelings also emerged in other types of tracking activities such as heart rate, food consumption and calories, and sleep, but they were not as strong as when people tracked their weight and menstruation cycles. Tracking exercise (running, walking, and cycling) often related to joy and pride in one's data. Chapter Six found this interactive relation between feelings, body and data occurred much more clearly in relation to weight data and menstruation cycle. For those who despaired about putting on weight due to illness, viewing weight data stirred negative feelings.

The final finding of this chapter was that some types of metrics triggered feelings. Numeric data rarely invoked people's feelings, while data visualisations easily led to emotional engagement with self-tracking data. The line chart was considered the clearest style of visualised data that self-trackers could easily understand. When they understood the information in line charts, they experienced emotional connections with the data. Aesthetic elements (such as colours, user interfaces, circles, and patterns) of data visualisation sometimes triggered feelings about their data and designs. Some complicated charts confused self-trackers.

In short, feelings enable people to interpret their data and make sense of both their data and their bodies, and feelings led them to make decisions about self-tracking. It was difficult to separate these three aspects. Embodied sensations and emotional responses sometimes differed in relation to the data. In turn, embodied sensations and emotional responses towards self-tracking data were intertwined with the data itself. People's interpretations about their bodies through feelings and emotions were sometimes different to what their data told them. This could draw people's attention to learning about their bodily situations and understanding their data. The differences related to the uncertainty about what people can trust in terms of body or data and how they can adjust their lifestyles. Sometimes self-trackers enacted agency about their embodied sensations and emotions, which caused them to question the data. Some people had negative feelings about knowing what was going on between their body and the data. These findings contribute to knowledge of how people feel differently about tracking different types of activities. Studying different types of self-tracking made it possible to identify which types of tracking led people to be more expressive about feelings compared to other types of tracking.

8.2.3 Sharing

Chapter Seven focused on sharing in relation to digital self-tracking and addressed the third research question. It showed that sharing is a process of self-documentation of everyday life on social media, a form of online identity construction through self-representation of the self, and a form of social communication, both online and offline. Sharing involves interpreting and using data in self-tracking practices while navigating aspects of social media, intimate relations, and the self. Complex intimate social lives in self-tracking practices are visible through sharing, both publicly and privately. The chapter developed observations from existing self-tracking literature and found new meanings of sharing in relation to self-tracking

practices. In my research, interviewees talked about local or limited sharing practices, which were different from those participants described in previous scholarship. An additional analysis of public sharing on Weibo demonstrated similar and different patterns of sharing self-tracking data in comparison to previous studies.

The first finding in Chapter Seven concerned self-documentation of everyday life through sharing self-tracking data. I also observed sharing on social media that involved self-documentation of everyday life, experiences, thoughts, and feelings in relation to self-tracking. As seen in previous studies, self-trackers shared their data publicly on social media, from physical exercises to food consumption (Kent, 2020b; Lomborg and Frandsen, 2016; Sharon, 2017). My finding extended previous work on sharing self-tracking data on social media (Kent, 2018; 2020) by highlighting the point that self-tracking data is not always central to sharing practices. Rather, documenting everyday life is often a more important purpose.

The second main finding in this chapter concerned online identity construction in terms of self-representation. Sharing various types of self-tracking data and successful experiences represented active, disciplined, and healthy selves. Self-trackers presented different types of identities on social media by sharing successes, romantic relationships, the active self, the healthy self, and the anxious self. Kent (2020) argues that self-trackers tend to build a healthy self on Instagram. My findings provide a wider picture of online identity. Participants in this study sometimes represented themselves differently on different platforms, as they considered tacit rules about what people can and cannot do on a platform and how the platform's norms affected how people represented themselves. This resulted in people carefully sharing what they perceived to be the 'right' things and in the 'correct' way – without looking silly or obsessive – factoring in societal expectations around sharing.

The third finding in Chapter Seven was that people perceived sharing self-tracking practices as a form of communication, including online communication with audiences and offline communication with close friends and colleagues. Existing research on communicative self-tracking (Sharon and Zandbergen, 2017; Lomborg and Frandsen, 2016) has suggested that sharing self-tracking numbers and stories is a way of sharing personal lives with other people who are intimate relations or other self-trackers. Weiner and colleagues (2020) showed how people share records with intimate relations privately both off and online. I brought new sharing practices into the Chinese context – sharing data between family, friends and partners, and resistance to sharing *guanxi* (关系) in self-tracking practices. In my study, sharing about self-tracking was a way of creating relationships with bosses and colleagues in the workplace, and maintaining *guanxi* with family, friends and partners. In this context, self-tracking was given social meaning within social relationships.

Additionally, sharing step data on WeRun on WeChat can be a form of currency, respect or filial piety and 'liking' such data becomes an obligation and currency, as it was a way of securing jobs or demonstrating respect to family elders. Some users developed this self-tracking function as a way of developing *guanxi*, although others communicated with colleagues and implied that they tried to build their relationships. Many participants in my

study aimed to resist this form of developing *guanxi*. I argue that WeRun is another way of developing and maintaining *guanxi*, but it is not for everybody. It also creates a new form of social surveillance by automatically sharing pedometer data with peers and it can lead to a reluctance to share on WeRun.

Sharing through offline communication was also used to seek others' attention, gain comfort from intimate relations, and maintain relationships with partners, friends and family. John (2013a) argued that on social media platforms, people are invited and encouraged to share, while sharing in the Chinese context can be different from in Western countries. Participants in this study opened up to their intimate relations, and some of them downloaded apps with their partners, looked at the same accounts and communicated about their periods, weight and steps. Sharing the same accounts and data with partners was regarded as a way of caring and demonstrating love for each other and couples could talk about their self-tracking experiences, data and ordinary life stories. Other participants were open to talking about a range of data (including periods, pregnancy, weight, steps) with friends and family.

These findings responded to the third and fourth research questions, indicating that self-trackers did share their self-tracking data online and offline in China, representing their online identities through sharing practices such as a healthy self and communicating with others. These findings were consistent with the existing literature.

8.3 Methodological Reflections and Contributions

My research approach has contributed to methodologies for self-tracking studies by combining qualitative interviews and an objective elicitation method with semantic network analysis. Initial and repeated semi-structured interviews have demonstrated their benefit for gathering detailed personal self-tracking experiences and feelings towards self-tracking. The photo-elicitation method helped to make participants comfortable in talking about their self-tracking experiences by interpreting screenshots of data and data visualisations. Text mining and semantic network analysis were helpful to gather and analyse a large volume of rich social media data – people shared things about self-tracking in interviews that they rarely shared in public. This quantitative approach also demonstrated a broader picture of what and how people shared in relation to self-tracking online, which makes it a new method for exploring self-tracking on social media.

Also, there were some differences about expressing feelings among different participants. Some participants said more about sharing, and some said more about feelings. It is important to acknowledge that people had different personalities and backgrounds, so they contributed diverse research data. Some participants easily expressed their feelings while others expressed none. I was aware of the gendered diversity in interviews whereby in this study female participants articulated emotions and more easily talked about their feelings than male participants.

Additionally, participants with a higher educational background or occupations related to digital technologies brought IT and marketing knowledge into their explanations about what self-tracking and data meant for them. To deal with this issue, it would be important to find other approaches to help people who are not from these relevant backgrounds explain their understandings of data. For example, participation in focus group would give them opportunities to build their understandings through group discussion, which might help them express their opinions. Alternatively, I could provide some data as examples to interpret the data first, and then ask participants to explain their own data in a similar way.

It is essential to acknowledge the exclusion of older age groups in this study. The interview method used in this research was not aimed to generalise the entire Chinese population of 'Chinese self-trackers', those who self-tracked activities and bodies in their everyday lives in China. Both the interview sample and the posts selected from Sina Weibo and WeChat's Moments mostly represented the younger generation's experiences, thoughts, and feelings towards digital self-tracking. While the absence of these older groups did not impede the achievement of research objectives and the answering of research questions, having two or three older self-trackers in the interviews would have provided a more comprehensive findings for this study. Future research could explore older people in China to extend understandings of the place of everyday self-tracking.

8.4 Limitations of the Research and Practical Implications of the Study

The limitations of this research are methodological. One of the methodological limitations was in the difficulty of studying feelings. I made notes about tones, emotions, and other evidence that interviewees used in expressing their feelings. However, my notes were imperfect and could have been richer and more detailed. When I was writing Chapter Six, I occasionally had a strong sense that there were feelings going on, but I did not have clear evidence in my fieldwork notes. Expressing feelings could randomly appear anytime on any topic and flow along with the conversations. Sometimes when I focused on listening to participants' stories and thought about follow-up questions, I could miss some details in relation to their feelings. It would be easy to study people's abstract feelings as the main theme of a research project but hard to take care of more than one research theme at the same time during interviews. For example, when interview questions focus on the theme of sharing, it might miss implied feelings of participants and chances to ask them to explain their feelings in detail. Fortunately, I still managed to discuss this sub-topic about feelings by following interview questions under the topic, such as "how do you feel about that?" Also, interview recordings helped me to recognise and interpret participants' feelings when I transcribed interviews. Additionally, repeat interviews gave me a second chance to let participants explain their feelings if I thought they were important for this study, and increased my awareness of some participants' feeling expressions if I noticed they easily talked about their feelings in their initial interviews. There is no perfect research method, but I could have collected richer data if I had made more detailed fieldwork notes.

This study is a small-scale research project with involved twenty-one participants and analysed Weibo posts. While it is impossible for this research to provide specific suggestions for the large Chinese population on how to use personal self-tracking technologies and data for their benefit, this section does highlight several points that could be communicated to policy makers, technology companies, and developers. As discussed in the Chapter One, the Chinese government has developed a range of policies and plans to improve citizens' health through self-tracking technologies and data in the coming years. However, this study challenges the effectiveness of those policies and strategies, as the findings suggest that the Chinese overtime work culture and stressful family life in China are already overwhelming self-trackers. They sometimes have little time to use such technologies to improve health. Therefore, the Chinese government must take into consideration the hard-working and living conditions of ordinary people, especially in big cities, while it attempts to successfully implement the digital health policies.

Additionally, Chapter Two of this study highlighted the existing work in the Chinese self-tracking literature, which found sustained usage of such technologies and their positive impact on users' behaviour changes. The participants' experiences in this research also suggest their diverse uses of devices and apps. They preferred using comprehensive versions of trackers and called for synchronisation of various types of data within one device or app, rather than downloading multiple apps on their mobile phones. To ensure the sustainable development of their products, self-tracking companies and developers can consider technical cooperation with each other, including sharing an ecosystem with strong data protection and privacy regulation. It is worth noting that some apps used by my participants enabled connection with the popular WeChat supper app.

8.5 Future Research

Discussion in Chapter Four revealed the main functions of self-tracking technologies in which interview participants engaged in their everyday uses. It briefly provided a background of what, how and why research participants tracked. It would be interesting to build upon this research to conduct a systematic critical analysis of a wider number of self-tracking devices and apps, using a combination of a walkthrough method and interviews. Such further research would be valuable to gain further and deeper understanding of what Chinese societal and cultural meanings are embedded in different types of self-tracking technologies, how they attempt to shape ordinary users, similarities and differences between Chinese and Western technologies, and how Chinese people use them to their own ends. This would contribute to the understanding of agency of self-tracking technologies and ordinary people in China.

Married participants included five male and one female self-trackers. Male participants demonstrated their adjustments and struggles with their self-tracking practices, while the female participant never mentioned the impact of domestic life on her self-tracking behaviour. It would be worth exploring married women's experiences and attitudes about

domestic life and self-tracking to understand gender equality in self-care in married life through the lens of self-tracking practices.

It was notable that most Weibo users rarely shared about self-tracking in public and a few users who regularly shared also stopped doing so at some point. This study only interviewed one social media user about what, when and why she shared about sleep data on Weibo and WeChat. It would be helpful to have conversations with more Weibo users to understand how and why they use self-tracking technologies and social media to manage their life and health, what identities they attempted to perform on social media, and how sharing experiences are linked to their offline behaviours in everyday life. Similarly, Kent (2020b) found in her study of sharing self-tracking data on Instagram that some of her participants left Instagram temporarily or permanently to avoid normalised self- and community surveillance and community practices. It would be instructive to research what happens in the lives, experiences, and feelings of social media users who disengage and detox from their Weibo and WeChat and disconnect with practices of sharing self-tracking data on both platforms.

8.6 Concluding Thoughts

This thesis primarily attempted to study the meaning of self-tracking data for people in China. However, in the fieldwork participants demonstrated their interests in not only data but also their devices and apps, and their everyday lives. The first two interviews emphasised that studying data should not be separated from people's lives. During my PhD journey, living with data in everyday life has become one of the key research topics in sociological and critical data studies (Burgess et al., 2022; Kent, 2020b; Trace and Zhang, 2020). Therefore, this thesis ended with the overarching aim about meanings of self-tracking practices and data in everyday life. As my supervisors' research work on the importance of individuals and ordinariness strongly shaped my research interests throughout my PhD studies, I learned to appreciate and carefully listen to each of my participants, who volunteered to share their lived experiences with me. Their stories gave meaning to this thesis.

Bibliography

ABTAHI, P., DING, V., YANG, A. C., BRUZZESE, T., ROMANOS, A. B., MURNANE, E. L., FOLLMER, S. & LANDAY, J. A. 2020. Understanding physical practices and the role of technology in manual self-tracking. *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies,* 4**,** 1-24.

ADLER, P. A., ADLER, P. & FONTANA, A. 1987a. Everyday life sociology. *Annual Review of Sociology***,** 217-235.

ADLER, P. A., ADLER, P. & FONTANA, A. 1987b. Everyday life sociology. *Annual Review of Sociology,* 13**,** 217-235.

AGENCY, X. N. 2022. At present, more than 96% of the counties and districts in the country have launched the National Healthy Lifestyle Action.

AJANA, B. 2018. Communal self-tracking: Data philanthropy, solidarity and privacy. *Self-tracking.* Springer.

AJANA, B., BRAGA, J. & GUIDI, S. 2021. *The Quantification of Bodies in Health : Multidisciplinary Perspectives,* Bingley, Emerald Publishing Limited.

ALGERA, E. 2022. Knowing (with) the body: Sensory knowing in contraceptive self-tracking. *Sociology of Health & Illness*.

ALHABASH, S. & MA, M. 2017. A tale of four platforms: Motivations and uses of Facebook, Twitter, Instagram, and Snapchat among college students? *Social media+ society,* 3**,** 2056305117691544.

ALKIRE, S. 2005. Subjective quantitative studies of human agency. *Social indicators research,* 74**,** 217-260.

ANDERSON, B. 2009. Affective atmospheres. *Emotion, space and society,* 2**,** 77-81.

APPLE.COM. 2022a. *Apple fitness* [Online]. Available: https://www.apple.com/uk/apple-fitness-plus/ [Accessed].

APPLE.COM 2022b. Apps on apple watch.

AZUNGAH, T. 2018. Qualitative research: deductive and inductive approaches to data analysis. *Qualitative research journal*.

BACK, L. 2020. Foreword: Making the mundane remarkable. *Mundane methods: Innovative ways to research the everyday***,** xiv-xviii.

BALAKRISHNAN, J. & GRIFFITHS, M. D. 2017. Social media addiction: What is the role of content in YouTube? *Journal of behavioral addictions,* 6**,** 364-377.

BASOV, N., DE NOOY, W. & NENKO, A. 2021. Local meaning structures: mixed-method sociosemantic network analysis. *American journal of cultural sociology,* 9**,** 376-417.

BENNETT, A. 2005. Culture and everyday life.

BERG, M. 2017. Making sense with sensors: Self-tracking and the temporalities of wellbeing. *Digital Health,* 3**,** 2055207617699767.

BHANDARI, A. & BIMO, S. 2022. Why's everyone on TikTok now? The algorithmized self and the future of self-making on social media. *Social Media+ Society,* 8**,** 20563051221086241.

BI, J., HUANG, Y., XIAO, Y., CHENG, J., LI, F., WANG, T., CHEN, J., WU, L., LIU, Y. & LUO, R. 2014. Association of lifestyle factors and suboptimal health status: a cross-sectional study of Chinese students. *BMJ open,* 4**,** e005156.

BI, J.-L., CHEN, J., SUN, X.-M., NIE, X.-L., LIU, Y.-Y., LUO, R. & ZHAO, X.-S. 2019. The development and evaluation of a sub-health self-rating scale for university students in China. *BMC Public Health,* 19**,** 1-10.

BLONDEL, V. D., GUILLAUME, J.-L., LAMBIOTTE, R. & LEFEBVRE, E. 2008. Fast unfolding of communities in large networks. *Journal of statistical mechanics: theory and experiment,* 2008**,** P10008.
BOZTEPE, S. & BERG, M. 2020. Connected eating: Servitising the human body through digital food technologies. *Digital food cultures.* Routledge.
BRAKE, D. R. 2014. *Sharing our lives online: Risks and exposure in social media*, Springer.
BRAUN, V. & CLARKE, V. 2006. Using thematic analysis in psychology. *Qualitative research in psychology,* 3**,** 77-101.
BUNKENBORG, M. 2014. Subhealth: Questioning the quality of bodies in contemporary China. *Medical anthropology,* 33**,** 128-143.
BURGESS, J., ALBURY, K., MCCOSKER, A. & WILKEN, R. 2022. *Everyday Data Cultures*, John Wiley & Sons.
BURKITT, I. 2002. Complex emotions: Relations, feelings and images in emotional experience. *The sociological review,* 50**,** 151-167.
CALABRESE, C., ANDERTON, B. N. & BARNETT, G. A. 2019. Online Representations of "Genome Editing" Uncover Opportunities for Encouraging Engagement: A Semantic Network Analysis. *Science Communication,* 41**,** 222-242.
CAO, X., GONG, M., YU, L. & DAI, B. 2020. Exploring the mechanism of social media addiction: An empirical study from WeChat users. *Internet Research,* 30**,** 1305-1328.
CARDELL, K. 2018. Is a Fitbit a diary? Self-tracking and autobiography. *M/C Journal,* 21.
CARR, C. T. & HAYES, R. A. 2015. Social media: Defining, developing, and divining. *Atlantic journal of communication,* 23**,** 46-65.
CHAN, A. K.-L. & TAN, S.-H. 2004. *Filial piety in Chinese thought and history*, RoutledgeCurzon London.
CHEN, H. 2018. Smart health facilitator: Chinese consumers' perceptions and interpretations of fitness mobile apps. *mHealth Innovation in Asia***,** 109-122.
CHEN, M. & PENG, A. Y. 2022. Why Do People Choose Different Social Media Platforms? Linking Use Motives With Social Media Affordances and Personalities. *Social Science Computer Review***,** 08944393211049120.
CHEN, X. & DENG, S. 2014. Influencing factors of answer adoption in social Q&A communities from users' perspective: Taking Zhihu as an example. *Journal of Data and Information Science,* 7**,** 81.
CHEN, Y., MAO, Z. & QIU, J. L. 2018. *Super-sticky WeChat and Chinese society*, Emerald Group Publishing.
CHO, H., CHI, C. & CHIU, W. 2020. Understanding sustained usage of health and fitness apps: Incorporating the technology acceptance model with the investment model. *Technology in Society,* 63**,** 101429.
CHOE, E. K., LEE, N. B., LEE, B., PRATT, W. & KIENTZ, J. A. Understanding quantified-selfers' practices in collecting and exploring personal data. Proceedings of the SIGCHI conference on human factors in computing systems, 2014. 1143-1152.
CNNIC. 2022a. *The 49th Statistical Report on China's Internet Development* [Online]. Available: https://www.cnnic.com.cn/IDR/ReportDownloads/202204/P020220424336135612575.pdf [Accessed].
CNNIC 2022b. The 49th Statistical Report on China's Internet Development.
COSTA FIGUEIREDO, M., CALDEIRA, C., EIKEY, E. V., MAZMANIAN, M. & CHEN, Y. 2018. Engaging with health data: The interplay between self-tracking activities and emotions in fertility struggles. *Proceedings of the ACM on Human-Computer Interaction,* 2**,** 1-20.

CRAWFORD, K., LINGEL, J. & KARPPI, T. 2015. Our metrics, ourselves: A hundred years of self-tracking from the weight scale to the wrist wearable device. *European Journal of Cultural Studies,* 18**,** 479-496.
CSC. 2016. *Outline of China Health Plan for 2030* [Online]. Available: http://www.gov.cn/zhengce/2016-10/25/content_5124174.htm [Accessed].
CSC. 2022a. *At present, more than 96% of the counties and districts in the country have launched the National Healthy Lifestyle Action* [Online]. Available: http://www.gov.cn/xinwen/2022-08/29/content_5707303.htm [Accessed].
CSC. 2022b. *The notice of the national health planning for the "14th Five-Year Plan" issued by the State Councile* [Online]. Available: http://www.gov.cn/zhengce/content/2022-05/20/content_5691424.htm [Accessed].
DANESI, G., PRALONG, M. & PIDOUX, V. 2018. Embodiment and Agency through Self-tracking Practices of People Living with Diabetes. *In:* AJANA, B. (ed.) *Metric Culture.* Emerald Publishing Limited.
DANOWSKI, J. A. 1993. Network analysis of message content. *Progress in communication sciences,* 12**,** 198-221.
DIDŽIOKAITĖ, G., SAUKKO, P. & GREIFFENHAGEN, C. 2018a. Doing calories: The practices of dieting using calorie counting app MyFitnessPal. *Metric culture.* Emerald Publishing Limited.
DIDŽIOKAITĖ, G., SAUKKO, P. & GREIFFENHAGEN, C. 2018b. The mundane experience of everyday calorie trackers: Beyond the metaphor of Quantified Self. *New Media & Society,* 20**,** 1470-1487.
DIGBY, S. 2006. The casket of magic: Home and identity from salvaged objects. *Home Cultures,* 3**,** 169-190.
DONG, M., CHEN, L. & WANG, L. 2019. Investigating the user behaviors of sharing health-and fitness-related information generated by Mi Band on Weibo. *International journal of human–computer interaction,* 35**,** 773-786.
DONGJIN, L. & YUDONG, Z. 2018. Quantified self in the field of consumption: A literature review and prospects. *Foreign Economics & Management,* 40**,** 3-17.
DRIEGER, P. 2013. Semantic network analysis as a method for visual text analytics. *Procedia-social and behavioral sciences,* 79**,** 4-17.
ELMHOLDT, K. T., ELMHOLDT, C. & HAAHR, L. 2021. Counting sleep: Ambiguity, aspirational control and the politics of digital self-tracking at work. *Organization,* 28**,** 164-185.
ENDO, T. 2010. Epistemic stance marker as a disagreement preface: Wo juede 'I feel/think'in Mandarin conversation in response to assessments. *京都大学言語学研究,* 29**,** 43-76.
ENLI, G. S. & THUMIM, N. 2012. Socializing and Self-Representation online: Exploring Facebook. *Observatorio (OBS*),* 6.
ESMONDE, K. 2020. 'There's only so much data you can handle in your life': accommodating and resisting self-surveillance in women's running and fitness tracking practices. *Qualitative Research in Sport, Exercise and Health,* 12**,** 76-90.
EVANS, C. & LEWIS, J. 2018. Analysing semi-structured interviews using thematic analysis: Exploring voluntary civic participation among adults.
FESTIC, N., LATZER, M. & SMIRNOVA, S. 2021. Algorithmic self-tracking for health: User perspectives on risk awareness and coping strategies. *Media and Communication,* 9**,** 145-157.
FIORE-GARTLAND, B. & NEFF, G. 2015. Communication, mediation, and the expectations of data: Data valences across health and wellness communities. *International Journal of Communication,* 9**,** 19.

FORS, V., BÄCKSTRÖM, Å. & PINK, S. 2013. Multisensory emplaced learning: Resituating situated learning in a moving world. *Mind, Culture, and Activity,* 20**,** 170-183.
FOTOPOULOU, A. 2018. From networked to quantified self: Self-tracking and the moral economy of data sharing. *A networked self and platforms, stories, connections.* Routledge.
FROSH, P. 2015. Selfies| The gestural image: The selfie, photography theory, and kinesthetic sociability. *International journal of communication,* 9**,** 22.
FU, P. P., WU, R., YANG, Y. & YE, J. 2007. Chinese culture and leadership. *Culture and Leadership across the World.* Psychology Press.
GAN, C. & LI, H. 2018. Understanding the effects of gratifications on the continuance intention to use WeChat in China: A perspective on uses and gratifications. *Computers in Human Behavior,* 78**,** 306-315.
GAO, C., ZHOU, L., LIU, Z., WANG, H. & BOWERS, B. 2017. Mobile application for diabetes self-management in China: Do they fit for older adults? *International journal of medical informatics,* 101**,** 68-74.
GAO, Q., TIAN, Y. & TU, M. 2015. Exploring factors influencing Chinese user's perceived credibility of health and safety information on Weibo. *Computers in human behavior,* 45**,** 21-31.
GOH, D. H.-L., ANG, R. P., CHUA, A. Y. & LEE, C. S. Why we share: A study of motivations for mobile media sharing. Active Media Technology: 5th International Conference, AMT 2009, Beijing, China, October 22-24, 2009. Proceedings 5, 2009. Springer, 195-206.
GORDON, M., ALTHOFF, T. & LESKOVEC, J. Goal-setting and achievement in activity tracking apps: a case study of MyFitnessPal. The World Wide Web Conference, 2019. 571-582.
GORICHANAZ, T. 2019a. Conceptualizing self-documentation. *Online Information Review*.
GORICHANAZ, T. 2019b. Self-portrait, selfie, self: Notes on identity and documentation in the digital age. *Information,* 10**,** 297.
GRENFELL, P., TILOUCHE, N., SHAWE, J. & FRENCH, R. S. 2021. Fertility and digital technology: narratives of using smartphone app 'natural cycles' while trying to conceive. *Sociology of Health & Illness,* 43**,** 116-132.
GUBRIUM, J. F., HOLSTEIN, J. A., MARVASTI, A. B. & MCKINNEY, K. D. 2012. *The SAGE handbook of interview research: The complexity of the craft*, Sage Publications.
GUI, X., CHEN, Y., CALDEIRA, C., XIAO, D. & CHEN, Y. When fitness meets social networks: Investigating fitness tracking and social practices on werun. Proceedings of the 2017 CHI conference on human factors in computing systems, 2017. 1647-1659.
GUO, F. & LIN, Y. A sub-health self-check system using image information of eye expression. 2008 IEEE International Symposium on IT in Medicine and Education, 2008. IEEE, 719-723.
HAN, Q. & ZHENG, W. 2005. *A New Study of Service-Oriented Television Programs*, Beijing: China Broadcasting and Television Press.
HANG, Y. 2021. Research on China's Special Working Hours Management System Based on the Background of Internet Industry. *Open Journal of Social Sciences,* 9**,** 323-331.
HARPER, D. 2002. Talking about pictures: A case for photo elicitation. *Visual studies,* 17**,** 13-26.
HARWIT, E. 2017. WeChat: Social and political development of China's dominant messaging app. *Chinese Journal of Communication,* 10**,** 312-327.
HEYEN, N. B. 2020. From self-tracking to self-expertise: The production of self-related knowledge by doing personal science. *Public Understanding of Science,* 29**,** 124-138.

HILDEBRANDT, B. A., RACINE, S. E., KEEL, P. K., BURT, S. A., NEALE, M., BOKER, S., SISK, C. L. & KLUMP, K. L. 2015. The effects of ovarian hormones and emotional eating on changes in weight preoccupation across the menstrual cycle. *International Journal of Eating Disorders,* 48**,** 477-486.
HO, D. Y.-F. 1994. Filial piety, authoritarian moralism, and cognitive conservatism in Chinese societies. *Genetic, social, and general psychology monographs*.
HOCHSCHILD, A. R. 2002. The sociology of emotion as a way of seeing. *Emotions in social life.* Routledge.
HOLMES, H. 2020. Material relationships: Object interviews as a means of studying everyday life. *Mundane methods.* Manchester University Press.
HUANG, G. & ZHOU, E. 2018. Time to work out! Examining the behavior change techniques and relevant theoretical mechanisms that predict the popularity of fitness mobile apps with Chinese-language user interfaces. *Health communication*.
HUANG, Z., SOLJAK, M., BOEHM, B. O. & CAR, J. 2018. Clinical relevance of smartphone apps for diabetes management: A global overview. *Diabetes/metabolism research and reviews,* 34**,** e2990.
HUAWEI.COM. 2022. *Huawei health* [Online]. Available: https://consumer.huawei.com/uk/mobileservices/health/ [Accessed].
HUMPHREYS, L. 2018. *The qualified self: Social media and the accounting of everyday life*, MIT press.
HUTCHBY, I. 2001. Technologies, texts and affordances. *Sociology-the Journal of the British Sociological Association,* 35**,** 441-456.
JACOBSEN, M. H. 2019. *Emotions, everyday life and sociology*, Routledge, Taylor & Francis Group.
JACOMY, M., VENTURINI, T., HEYMANN, S. & BASTIAN, M. 2014. ForceAtlas2, a continuous graph layout algorithm for handy network visualization designed for the Gephi software. *PloS one,* 9**,** e98679.
JIA, L. 2022. Forgotten passwords and Long-Gone exes: the life and death of Renren. *Internet Histories,* 6**,** 133-153.
JIANG, X., ZHANG, L., GAO, Y., HE, C., TANG, Z. & SUN, J. 2021. An Empirical Study on Physical Sub-Health Risk Perception: Physical Examination Data of Tertiary Grade-A Hospitals in Anhui Province, China.
JIANG, Y., DING, X., LIU, D., GUI, X., ZHANG, W. & ZHANG, W. 2022. Designing Intelligent Self-Checkup Based Technologies for Everyday Healthy Living. *International Journal of Human-Computer Studies***,** 102866.
JINGWEN, Z. 2022. *Encourage healthy lifestyles: business opportunities and future of digital voluntary health model* [Online]. Available: https://cn.chinadaily.com.cn/a/202202/17/WS620e070fa3107be497a06b3e.html [Accessed].
JOHN, N. A. 2013a. Sharing and Web 2.0: The emergence of a keyword. *New media & society,* 15**,** 167-182.
JOHN, N. A. 2013b. The social logics of sharing. *The Communication Review,* 16**,** 113-131.
JOHN, N. A. 2017. *The age of sharing*, John Wiley & Sons.
JOHNSON, J. C. & WELLER, S. C. 2002. Elicitation techniques for interviewing. *Handbook of interview research: Context and method***,** 491-514.
KALEKIN-FISHMAN, D. 2013. Sociology of everyday life. *Current Sociology,* 61**,** 714-732.
KAMPHOF, I. 2016. Seeing again. Dementia, personhood and technology. *Ageing and Technology***,** 163.
KARLSSON, A. 2019. A room of one's own?: Using period trackers to escape menstrual stigma. *Nordicom Review,* 40**,** 111-123.

KARLSSON, A. 2021. Whose Bodies? Approaching the Quantified Menstruating Body Through a Feminist Ethnography. *The Quantification of Bodies in Health: Multidisciplinary Perspectives.* Emerald Publishing Limited.
KEANE, M. 2016. Internet+ China: Unleashing the innovative nation strategy. *International journal of cultural and creative industries,* 3**,** 68-74.
KENNEDY, H. 2016. *Post, mine, repeat: Social media data mining becomes ordinary*, Springer.
KENNEDY, H. 2018. Living with data: Aligning data studies and data activism through a focus on everyday experiences of datafication. *Krisis: Journal for Contemporary Philosophy,* 2018**,** 18-30.
KENNEDY, H. & ENGEBRETSEN, M. 2020. 1. Introduction: The relationships between graphs, charts, maps and meanings, feelings, engagements. *Data visualization in society.* Amsterdam University Press.
KENNEDY, H. & HILL, R. L. 2018. The feeling of numbers: Emotions in everyday engagements with data and their visualisation. *Sociology,* 52**,** 830-848.
KENNEDY, H., HILL, R. L., AIELLO, G. & ALLEN, W. 2016. The work that visualisation conventions do. *Information, Communication & Society,* 19**,** 715-735.
KENNEDY, H., OMAN, S., TAYLOR, M., BATES, J. & STEEDMAN, R. 2020. Public understanding and perceptions of data practices: A review of existing research. *Sheffield: The University of Sheffield*.
KENNEDY, J. 2019. *Digital media, sharing and everyday life*, Routledge.
KENT, R. 2018. Social media and self-tracking: Representing the 'health self'. *Self-tracking.* Springer.
KENT, R. 2020a. Self-tracking and digital food cultures: Surveillance and self-representation of the moral 'healthy'body. *Digital food cultures.* Routledge.
KENT, R. 2020b. Self-tracking health over time: from the use of instagram to perform optimal health to the protective shield of the digital detox. *Social Media+ Society,* 6**,** 2056305120940694.
KENT, R. 2021. Digital food tracking: Combining traditional and digital ethnographic methods to identify the influence of social media sharing of health and foods upon users' everyday lives. *Research methods in digital food studies.* Routledge.
KERSTEN-VAN DIJK, E. & IJSSELSTEIJN, W. A. 2016. Design Beyond the Numbers: Sharing, Comparing, Storytelling and the Need for a Quantified Us. *IxD&A,* 29**,** 121-135.
KHOT, R. A., HJORTH, L. & MUELLER, F. F. Understanding physical activity through 3D printed material artifacts. Proceedings of the SIGCHI conference on human factors in computing systems, 2014. 3835-3844.
KIM, Y. 2019. New Opportunities for Sociological Research. *Journal of Asian Sociology,* 48**,** 343-358.
KISHALI, N. F., IMAMOGLU, O., KATKAT, D., ATAN, T. & AKYOL, P. 2006. Effects of menstrual cycle on sports performance. *International Journal of Neuroscience,* 116**,** 1549-1563.
KITZMANN, A. 2003. That different place: Documenting the self within online environments. *Biography***,** 48-65.
KRESSBACH, M. 2021. Period hacks: menstruating in the big data paradigm. *Television & New Media,* 22**,** 241-261.
KRISTENSEN, D. B., KURUOGLU, A. P. & BANKE, S. 2021. Tracking towards care: Relational affordances of self-tracking in gym culture. *Sociology of Health & Illness,* 43**,** 1598-1613.

KRISTENSEN, D. B. & RUCKENSTEIN, M. 2018. Co-evolving with self-tracking technologies. *New Media & Society,* 20**,** 3624-3640.
LI, D. & YUDONG, Z. 2018. Quantified self in the field of consumption: A literature review and prospects. *Foreign Economics & Management,* 40**,** 3-17.
LI, I., DEY, A. & FORLIZZI, J. A stage-based model of personal informatics systems. Proceedings of the SIGCHI conference on human factors in computing systems, 2010. 557-566.
LI, Y., DING, J., WANG, Y., TANG, C. & ZHANG, P. 2019. Nutrition-related mobile apps in the China app store: assessment of functionality and quality. *JMIR mHealth and uHealth,* 7**,** e13261.
LIANG, W. & SHI, Y. 2014. Interpretation of the youth trend of "data-based self"--from "data-based self" to "data record maniac". *中国青年研究***,** 95-98.
LIGHT, B. 2014. *Disconnecting with social networking sites*, Springer.
LIGHT, B., BURGESS, J. & DUGUAY, S. 2018. The walkthrough method: An approach to the study of apps. *New media & society,* 20**,** 881-900.
LIU, X. 2021. Keeping fit in the smog: Health, self-tracking and air pollution in post-socialist China. *Catalyst: Feminism, Theory, Technoscience*.
LOMBORG, S. & FRANDSEN, K. 2016. Self-tracking as communication. *Information, Communication & Society,* 19**,** 1015-1027.
LOMBORG, S., LANGSTRUP, H. & ANDERSEN, T. O. 2020. Interpretation as luxury: Heart patients living with data doubt, hope, and anxiety. *Big Data & Society,* 7**,** 2053951720924436.
LOMBORG, S., THYLSTRUP, N. B. & SCHWARTZ, J. 2018. The temporal flows of self-tracking: Checking in, moving on, staying hooked. *New Media & Society,* 20**,** 4590-4607.
LU, X., CHEN, Y. & A. EPSTEIN, D. How Cultural Norms Influence Persuasive Design: A Study on Chinese Food Journaling Apps. Designing Interactive Systems Conference 2021, 2021a. 619-637.
LU, X., CHEN, Y. & EPSTEIN, D. A. 2021b. A Model of Socially Sustained Self-Tracking for Food and Diet. *Proceedings of the ACM on Human-Computer Interaction,* 5**,** 1-32.
LUO, C., CHEN, A., CUI, B. & LIAO, W. 2021. Exploring public perceptions of the COVID-19 vaccine online from a cultural perspective: Semantic network analysis of two social media platforms in the United States and China. *Telematics and Informatics,* 65**,** 101712.
LUPTON, D. 2012. M-health and health promotion: The digital cyborg and surveillance society. *Social Theory & Health,* 10**,** 229-244.
LUPTON, D. 2013. Quantifying the body: monitoring and measuring health in the age of mHealth technologies. *Critical public health,* 23**,** 393-403.
LUPTON, D. 2015. Quantified sex: a critical analysis of sexual and reproductive self-tracking using apps. *Culture, health & sexuality,* 17**,** 440-453.
LUPTON, D. 2016a. The diverse domains of quantified selves: self-tracking modes and dataveillance. *Economy and Society,* 45**,** 101-122.
LUPTON, D. 2016b. *The quantified self,* John Wiley & Sons.
LUPTON, D. 2016c. You are your data: Self-tracking practices and concepts of data. *Lifelogging.* Springer.
LUPTON, D. 2017a. Digital media and body weight, shape, and size: An introduction and review. *Fat Studies,* 6**,** 119-134.
LUPTON, D. 2017b. Feeling your data: Touch and making sense of personal digital data. *New Media & Society,* 19**,** 1599-1614.

LUPTON, D. 2017c. How does health feel? Towards research on the affective atmospheres of digital health. *Digital health,* 3**,** 2055207617701276.
LUPTON, D. 2017d. Lively data, social fitness and biovalue: The intersections of health self-tracking and social media.
LUPTON, D. 2017e. Self-tracking, health and medicine. Taylor & Francis.
LUPTON, D. 2019. 'It's made me a lot more aware': a new materialist analysis of health self-tracking. *Media International Australia,* 171**,** 66-79.
LUPTON, D. 2021. Self-tracking. *Information.* Columbia University Press.
LUPTON, D. & MASLEN, S. 2018. The more-than-human sensorium: sensory engagements with digital self-tracking technologies. *The Senses and Society,* 13**,** 190-202.
LUPTON, D., PINK, S., HEYES LABOND, C. & SUMARTOJO, S. 2018. Digital traces in context: Personal data contexts, data sense, and self-tracking cycling.
LUPTON, D. & SMITH, G. J. D. 2018. 'A Much Better Person': The Agential Capacities of Self-tracking Practices. *In:* AJANA, B. (ed.) *Metric Culture.* Emerald Publishing Limited.
LYALL, B. & ROBARDS, B. 2018. Tool, toy and tutor: Subjective experiences of digital self-tracking. *Journal of Sociology,* 54**,** 108-124.
MACKENZIE, D. A. & WAJCMAN, J. 1999. *The social shaping of technology*, Open university press.
MARWICK, A. E. 2015. Instafame: Luxury selfies in the attention economy. *Public culture,* 27**,** 137-160.
MCCLUSKY, M. 2009. The Nike+ Experiment-How a shoe sensor kicked off a fitness revolution. *Wired***,** 80.
MEETUP. 2019. *Quantified Self Meetup groups around the world* [Online]. Available: https://www.meetup.com/topics/quantified-self/ [Accessed].
MEISNER, C. & LEDBETTER, A. M. 2022. Participatory branding on social media: The affordances of live streaming for creative labor. *New Media & Society,* 24**,** 1179-1195.
MI.COM 2022. Table of Features, Mi watch.
MIZOROKI, S. & KIM, B. 2021. Sexual assaults blindsided by politics on Twitter: Semantic Network analysis of symbolic# MeToo cases in Japan and South Korea. *Semantic Network Analysis in Social Sciences.* Routledge.
MO, R. & LEUNG, L. 2015. Exploring the roles of narcissism, uses of, and gratifications from microblogs on affinity-seeking and social capital. *Asian Journal of Social Psychology,* 18**,** 152-162.
NAFUS, D. 2014. Stuck data, dead data, and disloyal data: The stops and starts in making numbers into social practices. *Distinktion: Scandinavian Journal of Social Theory,* 15**,** 208-222.
NAFUS, D. & SHERMAN, J. 2014. Big data, big questions| this one does not go up to 11: the quantified self movement as an alternative big data practice. *International journal of communication,* 8**,** 11.
NHC 2007. National healthy lifestyle day.
NHC 2018. Learning "three decreasing actions" of "three decresing actions and three health actions".
NIE, L., XIE, B., YANG, Y. & SHAN, Y. M. 2016. Characteristics of Chinese m-Health applications for diabetes self-management. *Telemedicine and e-Health,* 22**,** 614-619.
NIVA, M. 2017. Online weight-loss services and a calculative practice of slimming. *Health:,* 21**,** 409-424.
O'CONNOR, H. & MADGE, C. 2017. Online interviewing. *The SAGE handbook of online research methods,* 2**,** 416-434.

OLSEN, W. K., HARALAMBOS, M. & HOLBORN, M. 2004. Triangulation in Social Research:: Qualitative and Quantitative Methods Can Really Be Mixed. *Developments in sociology.* Causeway Press Ltd.
OMENA, J. J., RABELLO, E. T. & MINTZ, A. G. 2020. Digital methods for hashtag engagement research. *Social Media+ Society,* 6**,** 2056305120940697.
PAN, Y., YAN, J., LU, W. & SHAN, M. 2021. Sub-Health Status Survey and Influential Factor Analysis in Chinese during Coronavirus Disease 2019 Pandemic. *Journal of Korean Academy of Nursing,* 51**,** 5-14.
PANTZAR, M. & RUCKENSTEIN, M. 2015. The heart of everyday analytics: emotional, material and practical extensions in self-tracking market. *Consumption Markets & Culture,* 18**,** 92-109.
PANTZAR, M. & RUCKENSTEIN, M. 2017. Living the metrics: Self-tracking and situated objectivity. *Digital health,* 3**,** 2055207617712590.
PANTZAR, M., RUCKENSTEIN, M. & MUSTONEN, V. 2017. Social rhythms of the heart. *Health Sociology Review,* 26**,** 22-37.
PATON, C., HANSEN, M., FERNANDEZ-LUQUE, L. & LAU, A. Y. 2012. Self-tracking, social media and personal health records for patient empowered self-care. *Yearbook of medical informatics,* 21**,** 16-24.
PATTON, M. Q. 1990. *Qualitative evaluation and research methods*, SAGE Publications, inc.
PEÑA GANGADHARAN, S. & NIKLAS, J. 2019. Decentering technology in discourse on discrimination. *Information, Communication & Society,* 22**,** 882-899.
PINK, S. & FORS, V. 2017a. Being in a mediated world: self-tracking and the mind–body–environment. *cultural geographies,* 24**,** 375-388.
PINK, S. & FORS, V. 2017b. Self-tracking and mobile media: New digital materialities. *Mobile Media & Communication,* 5**,** 219-238.
PINK, S., RUCKENSTEIN, M., WILLIM, R. & DUQUE, M. 2018. Broken data: Conceptualising data in an emerging world. *Big Data & Society,* 5**,** 2053951717753228.
PINK, S., SUMARTOJO, S., LUPTON, D. & HEYES LA BOND, C. 2017. Mundane data: The routines, contingencies and accomplishments of digital living. *Big Data & Society,* 4**,** 2053951717700924.
PLANTIN, J.-C. & DE SETA, G. 2019. WeChat as infrastructure: The techno-nationalist shaping of Chinese digital platforms. *Chinese Journal of Communication,* 12**,** 257-273.
PRITZ, S. M. 2016. Making emotions count: the self-tracking of feelings. *Lifelogging.* Springer.
QIAN, H. 2005. Discussing and analyzing prevention and cure strategy of traditional Chinese medicine according to characteristic of sub-health condition. *China Journal of Traditional Chinese Medicine and Pharmacy*.
RAUCHFLEISCH, A. & SCHÄFER, M. S. 2015. Multiple public spheres of Weibo: A typology of forms and potentials of online public spheres in China. *Information, Communication & Society,* 18**,** 139-155.
RETTBERG, J. W. 2014. *Seeing ourselves through technology: How we use selfies, blogs and wearable devices to see and shape ourselves*, Springer Nature.
RETTBERG, J. W. 2017. Self-representation in social media.
RETTBERG, J. W. 2018. Apps as companions: how quantified self apps become our audience and our companions. *Self-tracking: Empirical and philosophical investigations***,** 27-42.

RICH, E. & MIAH, A. 2017. Mobile, wearable and ingestible health technologies: towards a critical research agenda. *Health Sociology Review,* 26**,** 84-97.
ROOKSBY, J., ROST, M., MORRISON, A. & CHALMERS, M. Personal tracking as lived informatics. Proceedings of the SIGCHI conference on human factors in computing systems, 2014. 1163-1172.
RUCKENSTEIN, M. 2014. Visualized and interacted life: Personal analytics and engagements with data doubles. *Societies,* 4**,** 68-84.
RUCKENSTEIN, M. & SCHÜLL, N. D. 2017. The datafication of health. *Annual review of anthropology,* 46**,** 261-278.
RUSSO, A., WATKINS, J., KELLY, L. & CHAN, S. 2008. Participatory communication with social media. *Curator: The Museum Journal,* 51**,** 21-31.
SCHNEIDER, A. & ARNOLD, R. 2022. *Move up: research on fitness wearable devices and apps in six countries* [Online]. Available: https://www-file.huawei.com/-/media/corporate/pdf/news/fitness-wearables-apps-report.pdf?la=zh [Accessed].
SCHÜLL, N. D. 2016. Data for life: Wearable technology and the design of self-care. *BioSocieties,* 11**,** 317-333.
SCOTT, S. 2009. *Making sense of everyday life*, Polity.
SCRINIS, G. 2020. *Nutritionism: the science and politics of dietary advice*, Routledge.
SEGEV, E. 2021. How to conduct semantic network analysis. *In:* SEGEV, E. (ed.) *Semantic Network Analysis in Social Sciences (pp. 16-31).* Routledge.
SERAFINELLI, E. 2018. *Digital life on Instagram: New social communication of photography*, Emerald Group Publishing.
SHAN, S., REN, J. & LI, C. 2017. The dynamic evolution of social ties and user-generated content: a case study on a Douban group. *Enterprise Information Systems,* 11**,** 1462-1480.
SHARON, T. 2017. Self-tracking for health and the quantified self: Re-articulating autonomy, solidarity, and authenticity in an age of personalized healthcare. *Philosophy & Technology,* 30**,** 93-121.
SHARON, T. & ZANDBERGEN, D. 2017. From data fetishism to quantifying selves: Self-tracking practices and the other values of data. *New Media & Society,* 19**,** 1695-1709.
SHI, J. 2021. Technology Competition Landscape of the Global Smart Watch Industry in 2021 (with Regional Application Distribution, Applicant Ranking, Patent Application Concentration, etc.).
SJÖKLINT, M., CONSTANTIOU, I. D. & TRIER, M. 2015. The complexities of self-tracking-an inquiry into user reactions and goal attainment. *Available at SSRN 2611193*.
SLOTTA, D. 2022a. *Popular apps to connect with wearable electronics in China in 2022* [Online]. Available: https://www.statista.com/statistics/1058066/china-popular-apps-to-connect-with-wearable-tech/ [Accessed].
SLOTTA, D. 2022b. *Popular apps to connect with wearable electronics in China in 2022, by age* [Online]. Available: https://www.statista.com/statistics/1058102/china-popular-apps-to-connect-with-wearable-tech-by-age/ [Accessed].
SONG, G. 2004. *The fragile scholar: Power and masculinity in Chinese culture*, Hong Kong University Press.
STATISTA. 2022. *Leading health and fitness apps in the Google Play Store worldwide in September 2022, by number of downloads* [Online]. Available: https://www.statista.com/statistics/690887/leading-google-play-health-worldwide-downloads/ [Accessed].

STATISTA. 2023. *Leading health and fitness apps worldwide in 2022, by downloads* [Online]. Available: https://www.statista.com/statistics/1284875/global-top-health-and-fitness-apps/ [Accessed].
SUN, W. 2015. Cultivating self-health subjects: Yangsheng and biocitizenship in urban China. *Citizenship Studies,* 19**,** 285-298.
SUN, W. 2016. Mediatization of yangsheng: The political and cultural economy of health education through media in China. *Lifestyle Media in Asia.* Routledge.
SWAN, M. 2012. Health 2050: The realization of personalized medicine through crowdsourcing, the quantified self, and the participatory biocitizen. *Journal of personalized medicine,* 2**,** 93-118.
SWAN, M. 2013. The quantified self: Fundamental disruption in big data science and biological discovery. *Big data,* 1**,** 85-99.
TAO, K. & EDMUNDS, P. 2018. Mobile APPs and global markets. *Theoretical Economics Letters,* 8**,** 1510.
THOMALA, L. L. 2022. *Key figures of mobile app usage in China in September 2022* [Online]. Available: https://www.statista.com/statistics/1239630/china-mobile-app-usage-key-figures/ [Accessed].
THOMALA, L. L. 2023a. *Average number of hours spent daily on mobile apps by users in China from 1st quarter 2019 to 4th quarter 2022* [Online]. Available: https://www.statista.com/statistics/1090400/china-average-daily-time-on-mobile-apps/ [Accessed].
THOMALA, L. L. 2023b. *Distribution of average daily time spent on mobile app categories by users in China as of 4th quarter 2022* [Online]. Available: https://www.statista.com/statistics/1043804/china-leading-sports-apps-monthly-active-users/ [Accessed].
THOMALA, L. L. 2023c. *Number of monthly active users (MAU) of the leading sports and fitness apps in China in June 2022* [Online]. Available: https://www.statista.com/statistics/1043804/china-leading-sports-apps-monthly-active-users/ [Accessed].
THROSBY, K. 2016. Immersion: Marathon swimming, embodiment and identity. *Immersion.* Manchester University Press.
TIIDENBERG, K. & GÓMEZ CRUZ, E. 2015. Selfies, image and the re-making of the body. *Body & society,* 21**,** 77-102.
TRACE, C. B. & ZHANG, Y. 2020. The quantified-self archive: Documenting lives through self-tracking data. *Journal of Documentation,* 76**,** 290-316.
TREEM, J. W. & LEONARDI, P. M. 2013. Social media use in organizations: Exploring the affordances of visibility, editability, persistence, and association. *Annals of the International Communication Association,* 36**,** 143-189.
TU, F. 2016. WeChat and civil society in China. *Communication and the Public,* 1**,** 343-350.
TU, R., HSIEH, P. & FENG, W. 2019. Walking for fun or for "likes"? The impacts of different gamification orientations of fitness apps on consumers' physical activities. *Sport Management Review,* 22**,** 682-693.
UNCHINA 2016. Sustainable Development Goal 3: Good Health and Well-being.
VAN DIJCK, J. & POELL, T. 2016. Understanding the promises and premises of online health platforms. *Big Data & Society,* 3**,** 2053951716654173.
VICARI, S. 2017. Twitter and non-elites: Interpreting power dynamics in the life story of the (#) BRCA Twitter stream. *Social Media+ Society,* 3**,** 2056305117733224.
VICARI, S. 2021. *Digital Media and Participatory Cultures of Health and Illness*, Routledge.

VICARI, S. & KIRBY, D. 2022. Digital platforms as socio-cultural artifacts: developing digital methods for cultural research. *Information, Communication & Society***,** 1-23.
WANG, F., LIU, Y. & XIE, M. 2022. IDC: Shipments of China's wearable device market in the third quarter of 2022 will drop by 8% year-on-year.
WANG, N., DENG, Z., WEN, L. M., DING, Y. & HE, G. 2019. Understanding the use of smartphone apps for health information among pregnant Chinese women: mixed methods study. *JMIR mHealth and uHealth,* 7**,** e12631.
WEINER, K., HENWOOD, F., WILL, C. & WILLIAMS, R. 2017. Self-monitoring for health: Questions for an emerging field. *Available at SSRN 3051201*.
WEINER, K. & WILL, C. 2015. Materiality matters: Blurred boundaries and the domestication of functional foods. *BioSocieties,* 10**,** 194-212.
WEINER, K., WILL, C., HENWOOD, F. & WILLIAMS, R. 2020. Everyday curation? Attending to data, records and record keeping in the practices of self-monitoring. *Big Data & Society,* 7**,** 2053951720918275.
WHOOLEY, M., PLODERER, B. & GRAY, K. On the integration of self-tracking data amongst quantified self members. Proceedings of the 28th International BCS Human Computer Interaction Conference on HCI 2014, 2014. British Computer Society BCS, 151-160.
WILL, C. M., HENWOOD, F., WEINER, K. & WILLIAMS, R. 2020. Negotiating the practical ethics of 'self-tracking'in intimate relationships: Looking for care in healthy living. *Social Science & Medicine,* 266**,** 113301.
WILLIAMS, R. 1958. Culture is ordinary. na.
WOLF, G. 2010. The data-driven life. *The New York Times,* 28.
WOLF, G., CARMICHAEL, A. & KELLY, K. 2010. The quantified self. *TED http://www. ted. com/talks/gary_wolf_the_quantified_self. html*.
WOLF, G. I. 2009. Quantified self. Aether.
XU, T., YANG, X., ZHANG, H. & ZHANG, J. An advanced data capture method based on sina weibo. 2015 International Conference on Social Science, Education Management and Sports Education, 2015. Atlantis Press, 1489-1492.
XU, Y. 2020. Domesticating the period-tracking app in everyday life: a case study of Easy Period in the Chinese context.
YANG, Y. 2021. The Stance-taking functions of gǎnjué (feel) and juéde (think) in Mandarin conversation. *Academic Journal of Humanities & Social Sciences,* 4.
YANG, Z. & VICARI, S. 2021. The Pandemic across Platform Societies: Weibo and Twitter at the Outbreak of the Covid-19 Epidemic in China and the West. *Howard Journal of Communications***,** 1-14.
YIN, S., CAI, X., WANG, Z., ZHANG, Y., LUO, S. & MA, J. 2022. Impact of gamification elements on user satisfaction in health and fitness applications: A comprehensive approach based on the Kano model. *Computers in Human Behavior,* 128**,** 107106.
YLI-KAUHALUOMA, S. & PANTZAR, M. 2018. Seeking connectivity to everyday health and wellness experiences: Specificities and consequences of connective gaps in self-tracking data. *Digital health,* 4**,** 2055207618779714.
YOUN, C. & JUNG, H. J. 2021. Semantic network analysis to explore the concept of sustainability in the apparel and textile industry. *Sustainability,* 13**,** 3813.
YU, H. 2017. Philanthropy on the move: Mobile communication and neoliberal citizenship in China. *Communication and the Public,* 2**,** 35-49.
YU, J.-L., SU, Y.-F., ZHANG, C., JIN, L., LIN, X.-H., CHEN, L.-T., HUANG, H.-F. & WU, Y.-T. 2022. Tracking of menstrual cycles and prediction of the fertile window via measurements of basal body temperature and heart rate as well as machine-learning algorithms. *Reproductive Biology and Endocrinology,* 20**,** 1-12.

YUCHUN, P. 2006. The Culture of "Guanxi" in Chinese Society——Also on Whether the Publicity of "Guanxi" Can Be Increased.
ZHAN, H. J. & MONTGOMERY, R. J. 2003. Gender and elder care in China: The influence of filial piety and structural constraints. *Gender & society,* 17**,** 209-229.
ZHANG, W. 2021. 2021 China smart wearable device industry overview.
ZHANG, X. & XU, X. 2020. Continuous use of fitness apps and shaping factors among college students: A mixed-method investigation. *International journal of nursing sciences,* 7**,** S80-S87.
ZHANG, Y. & SHAO, J. 2015. A systemic review of suboptimal health. *Global J Public Health,* 2**,** 20.
ZHANG, Y., ZHANG, H., ZHANG, C. & LI, D. 2020. The impact of self-quantification on consumers' participation in green consumption activities and behavioral decision-making. *Sustainability,* 12**,** 4098.
ZHANG, Y. D., LI, D. J., ZHANG, C. B. & ZHANG, H. L. 2019. Quantified or nonquantified: How quantification affects consumers' motivation in goal pursuit. *Journal of Consumer Behaviour,* 18**,** 120-134.
ZHAO, S., XU, Y., MA, X., JIANG, Z., LUO, Z., LI, S., YANG, L. T., DEY, A. & PAN, G. 2019. Gender profiling from a single snapshot of apps installed on a smartphone: An empirical study. *IEEE Transactions on Industrial Informatics,* 16**,** 1330-1342.
ZHU, Y. 2019. Social media engagement and Chinese international student recruitment: understanding how UK HEIs use Weibo and WeChat. *Journal of Marketing for Higher Education*.

Appendices

Appendix 1 Interview Information Sheet

Have You Counted Your Steps Today?

I am looking for ordinary people living in Beijing who use any type of self-tracking device or smartphone application in their everyday life who would be interested in participating in a PhD research project. You will use any of wearable devices and/or smartphone apps to track physical activities either indoors and/or outdoors, record weight loss, heart rate, monitor sleeping patterns, or manage menstrual cycle, etc.

Before you decide whether or not to participate, it is important for you to understand why this research is being done and exactly what it will entail. Please take time to read the following information carefully and discuss it with others if you wish. Ask me if there is anything that isn't clear, or if you'd like more information.

Background and Contributions of This Research

In recent years, through new digital technologies and the data produced with such technologies, people want to know more about their body and health situation, develop good habits, improve health and lifestyle, etc. Many people find that these technologies and the data they produce to be useful in achieving goals, while others feel frustrated or disappointed if the technologies they use do not work effectively, they cannot discern any useful information from it.

Based in the Department of Sociological Studies at the University of Sheffield in the UK, I am researching how different people are self-tracking differently in their everyday lives, and how they feel about and use their self-tracking data in China. Your participation can contribute to the knowledge creation about the relationship between humans, technology, and data in the context of Chinese culture and society. Your personal opinions can help self-tracking technological development by sharing ways in which you are actually using such technologies and data. Also, your own experiences can create a deeper understanding of the role of self-tracking data in ordinary people's health, self-care, and everyday lives. These could potentially help to inform national policy of developing digital health and help to understand existing values and issues of a large number of data produced by users on digital technologies in everyday life.

What Participation Involves

I will interview you online on WeChat for one hour, as you are currently using at least one or more device or app to self-track in your daily life. The interview may involve asking questions about potentially sensitive topics such as health or menstruation. You can choose not to answer these or any other questions, without needing to give explanation.

After the interview, if you are interested in talking about your self-tracking experiences and would be happy to provide more in-depth data, you will be invited to join a repeat interview, where you will share audio clips or text messages, and screenshots of your self-tracking data in the apps, or of self-tracking-related posts on social media platforms with me every 7 days. Based on the shared materials and audio clips or text messages you will be invited to take part in a repeat interview one month after the first interview in order to describe the recordings. As a token of appreciation for choosing to participate in the study, I will offer a 100 RMB (£11.87) Jing Dong voucher to each participant, along with an additional voucher of the same value for those who progress onto the repeat interviews.

Our interview conversation will be audio-recorded as research data. If you would like to participate the repeat interview, the materials you would share with me will be used as research data and also used as part of discussions in repeat interviews. Interview recordings will be deleted once I will type them up. All the research data will be stored in my personal laptop with an encrypted protection and then transferred to a University computer. If a University computer is inaccessible from Beijing, I will store all the research data on two separate hard disks with password-protection and keep them locked away securely. They will be anonymised and destroyed once I have gained my PhD degree. While I will use extracts from the data you provide in my research outputs, including thesis and research paper publication, any data relating to your identity such as a name, an identification number, location, or online identifier will not be included. You will not be identifiable in any of my research outputs in order to protect your privacy.

The Legal Basis of The Data Collection

This research has been approved by the University of Sheffield's Department of Sociological Studies' ethics committee in the UK. According to UK data protection legislation, collecting your personal data is necessary for the research purpose and 'the performance of a task carried out in the public interest'. Because the research might potentially involve sensitive information (such as your health condition), I need to let you know that I am applying the following condition in law: that the use of your data is 'necessary for scientific or historical research purposes'.

What To Do If You Are Interested

It is entirely up to you to decide whether or not to take part. If you decide to participate, you will be given this information sheet to keep. Once you have had a chance to read it and ask questions, I will ask you to sign a form to give your consent to being interviewed and provide you with a copy of the consent form to keep as well. You can still withdraw at any time during the research without having to give a reason. If you have any further questions, please ask. My contact details are below.

Contact Details

Researcher: Xiufeng Jia
Email: xiufeng@jiaxiufeng.com
Telephone (in China): to be updated later
The University's address: Department of Sociological Studies, Elmfield Building, Northumberland Road, Western Bank, Sheffield, South Yorkshire, UK, S10 2TU

If you would like to speak to someone rather than me regarding this research, please contact my supervisors:

Name: Professor Helen Kennedy
Email: h.kennedy@sheffield.ac.uk
Telephone: +44(0)114 222 6488

Name: Dr Kate Weiner
Email: k.weiner@sheffield.ac.uk
Telephone: +44(0)114 222 6491

Many thanks for reading this information!

今天你计算自己走了多少步了吗？

我正在寻找居住在北京的人，感兴趣参与我的博士研究项目。只要您日常使用任何自我追踪可穿戴设备或者手机应用 App，用来追踪您的室内室外活动，记录减肥情况，监控心率，了解睡眠状况或者管理例假，只要愿意就可参加。

在您决定是否参与之前，我有义务让您了解为什么要进行这个研究项目，以及它涉及哪些内容。如果您有意愿加入，请仔细阅读下面的信息，也可以和其他人讨论之后再做出决定。如果您有任何疑问或者想要了解更多相关信息，欢迎您随时询问。非常感谢您抽出宝贵时间阅读下列信息。

研究背景和贡献

近几年，通过这些新数字技术和其所产生的数据，人们希望更加了解他们的身体状况，养成良好的生活习惯，改善健康和生活方式， 或者获取一定的健康相关的知识。有的人认为这些设备和数据对于实现他们这些目标很有帮助，然而有的人则感觉到挫败和失望如果它们不能有效地记录或者不能为他们提供有用的信息。

基于英国谢菲尔德大学社会学研究的博士项目，我正在研究，在中国，不同用户每天如何以各自不同的式进行自我追踪，以及如何感受和使用他们的自我追踪数据。您的参与有助于探索在中国文化与社会中人类、技术和数据关系的科研知识。通过分享您切实使用这类技术和数据的方式，您的个人观点对于自我追踪技术的发展有所贡献。而且，您的个人经历能够帮助更加深刻地理解， 该数据在普通人的健康，自我照顾，以及整体日常生活中的作用。这些有利于发展国家正在倡导的数字健康政策，以及对于在人类日常生活中发展大数据所存在的价值和问题的认识。

开展研究

该研究项目将在北京持续 6 到 8 个月。我将与您进行一小时的采访，基于您目前正在日常使用至少一种或者一种以上的自我追踪设备或者手机 App，且没有加入任何使用自我追踪技术的团体。

在采访过程中，如果您有兴趣更加深入地谈论您的自我追踪技术的经历和数据，您将被邀请加入该研究项目的第二次采访。您将希望每周与我分享您手机 App 上自我追踪数据的截图，或者分享您在社交媒体发布的与自我追踪相关的内容。基于您记录的内容，一个月后，您将邀请进行第二次采访，用来描述所记录的内容和讲述相关的经

历。为了感谢您的参与，我将向每一位受访者提供 100 元京东购物券，对于第二次受访者，将会提供额外一份同等金额的京东购物券。

采访内容将会被录音作为研究数据。如果你将参与第二次采访，所分享的截图材料也将作为研究数据的一部分并用于第二次采访。一旦采访录音被誊写为文字，您的录音将被删除。

数据搜集的法律依据

所有研究数据将会被匿名，并在我博士完成后立即全部被销毁。尽管我会使用部分数据作为我研究成果的内容，比如博士论文和出版研究文献，但是为了保护您的隐私，您的名字不会在我任何研究成果中出现和识别。该研究项目已经得到了英国谢菲尔德大学社会学研究伦理委员会的批准。

如果您感兴趣，如何参与

是否决定参与该研究，完全取决于您自己的意愿。如果您同意参加，您可以保留该信息表。一旦您完成该阅读和解决疑问，您将需要签署一份知情同意书，以表示同意采访，并且保留一份该同意书的复印件。您可以在任何时候退出参与该研究，且不需要给出任何退出理由。如果您还有其他疑问，请随时询问。我的联系方式如下。

联系方式

研究人：贾秀锋
邮箱： xiufeng@jiaxiufeng.com
电话:

如果您想就此研究项目，需要与除我之外的其他人交涉，请联系我的导师：

姓名： Helen Kennedy 教授　　姓名：Kate Weiner 博士
邮箱： h.kennedy@sheffield.ac.uk　　邮箱： k.weiner@sheffield.ac.uk
电话： +44(0)114 222 6488　　电话： +44(0)114 222 6491

非常感谢您阅读该信息表。

Appendix 2 Initial Interview Schedule

Tell me a bit about yourself (Chinese context)
- Prompts: name, age, gender, degree, jobs; work life and home life
- What do you do, where do you live, who lives in your household, and your training.

Tell me what you track and why?
- Prompts: when start to track; have done it in the past? expectations to achieve anything
    - Have you ever given up tracking? (or considered giving up doing it in the future?) Why?
    - What the devices/apps are you currently using?
      - Prompts: why it/them, why useful; how often and how to use, on which occasions
    - What devices/app did you use in the past?
      - Prompts: why turn to the current one

Describe your experiences of using it/them (show me your device/app if you like)
- What features do you use and not use? What about new feature(s)?
  - Prompts: turn any features off and why?
- Describe the process of recording and storing data of the last time.
  - Prompts: when, where, and how to input the information; where to store the information and why; situations of stopped/forgetting to input it for a while, what happened;

Do you ever look at the information? What do you do with it?
- What information do you usually pay attention to? Why?
- When was the last time that you reviewed the information? Why?
  - Prompts: when and what situations to review it?
- What do you think about the information?
  - Prompts: how to represent/visualise it; feelings about figures/numbers; in what ways you find it helpful/unhelpful? / what data mean to you, how to use it, how you feel about it – ever feel proud/disappointed?
- What do you think when you see these tables, charts and numbers? What do you think about them?

Do you think the information is accurate? How do you know? Why do you feel like this?
- Prompts: represent your actual situations; understanding of how the device/app actually works (collect, store and represent the information)
    - Do you think the accuracy matters to you? Why? (Examples)
    - What specific differences does the information represent from actual situations?
      - Prompts: what causes discrepancies in the data (battery/unstable connection/broken etc.); feelings about discrepancies; how to deal with them and why
    - If some information is inaccurate, what is motivating you to keep tracking? Why?

Tell me your recent experiences in sharing and communicating your experiences and information with other users

- Do you talk to anyone about your self-tracking experiences/data? (experiences)
- Prompts: who, when, where and how; they use such technologies? what are you talking about with each other; why them; compare experiences/information and why?
- How do you use the social features? (sharing/forums/groups/seeking for information)
- Prompts: complete profile; follow any other users, why; share with them? how often; where (app/other platforms) and why; what to share; motivations of sharing; sharing in public/private setting and why?
- What do you often do when you see people sharing their data?
- Prompts: when to make comments; what comments; why to make them; receiving comments; feelings of receiving them
- What do you expect to gain after sharing and commenting? What happened after doing this? How do you feel during and after doing this?

Do you see any changes you since you started to track? Example(s)

- Prompts: perceptions about yourself; previous knowledge about things you are tracking; health; lifestyle etc.

- What things did make you change?
- Why you bother if you don't change anything? What does it mean to you? Why wear it?
- Do you think you will continue tracking this? Why?

Do you have any concerns about your data? (privacy, surveillance etc.)

- What do you concern when sharing or communicating your data with other people?
- What do you concern about uses of your data?

Debriefing

Any questions?
Ask for participating repeat interview after one month
Feedback requests after the interview

Appendix 3 Repeat Interview Guide Example

Materials

-Prompts: what features you use and how to use the App/device; what to record and not to record; what your recordings mean to you;

Tell me what screenshots you share with me and why chose these materials to share?

- Recently what activities did you actually do and track? Why did it?
- Where and how do you track, by describing specific experiences that you did recently?
- Do you track similarly or differently with the time when we did the initial interview? What happened?
- Why you recorded that activity that day but didn't record it in other days? What does this mean to you?
- When were you doing this? Why were you doing it?
- Do you do something new in your everyday life? Do you record it? Why?

Which screenshot do you want to start to talk about? Which is interesting to you the most? Tell me about it and why interesting to you?

Self-tracking practices and everyday life

- Tell me what happened related to your tracking activities and the Apps/devices over one month

-Prompts: what you do and use before and after the coronavirus; any changes and why; in which city to track (Beijing or hometown), where and who you live with;

- Routines in everyday life before and during the coronavirus outbreak
- Changes of self-tracking routines and activities
- Choose one screenshot to tell me about your experience of a whole process of self-tracking behind this screenshot
- Is it similar with what you usually do before the coronavirus outbreak?

Which way of tracking your activities do you prefer: automatically tracking like Apple Watch or manually tracking like Clue or Meetyou? Why? How do you feel about the two ways of self-tracking?

Tell me what the role of the data in your everyday life

- Any difficulties and challenges do you have when monitoring these things?

Data visualisations and everyday life

- What information can you get from the graphs? Why? What it means to you? What can it tell you? Tell me your thoughts and feelings when you look at them?
- What information you don't care and why?

The involved people in your self-tracking activities [Surveillance and care]

- Who do you live with before and after this? What is the role of someone in involving your self-tracking activity? Why do you think like this?
- What the role of your partners or other people in your tracking process? (Surveillance / care etc.)
- Do you want them to involve this? Why or why not?
- Why do you think it is a responsible action if he cares about the time of having sex with you?
- How much effects does his involving on your health, emotions, relationship and so on?

Sharing and communicating

- What does it mean to you when you talk about your situations as part of your self-tracking experiences with others?
- What you share and what you talk about with others

Impacts on everyday life and healthcare

- When did you record this? Did you record this straight away after the exercise? Why?
- How do you think about this workout result, when you look at this recording?
- What happened so you could monitor this regularly? How do you think about this monitoring habit in your everyday life.
- How was your body's conditions by that time when you monitored yourself? How do you feel now without monitoring it?
- Does your body and daily life have any change? Why?

Describe your feelings about the thing of monitoring swimming?

What do you know about how this app work?

- Do you think the way that you guess the final date of period might influence the accuracy?
- Why do you think like this?

Appendix 4 Participant Consent Form for Initial Interviews

Everyday Digital Self-Tracking Practices in China: Variations, Feelings, and Sharing

Consent Form

Please tick the appropriate boxes	**Yes**	**No**
Taking Part in the Project		
I have read and understood the project information sheet dated 22/08/2019 or the project has been fully explained to me. (If you will answer No to this question please do not proceed with this consent form until you are fully aware of what your participation in the project will mean.)	☐	☐
I have been given the opportunity to ask questions about the project.	☐	☐
I agree to take part in the project. I understand that taking part in the project will include being audio-recorded interviewed.	☐	☐
I understand that my taking part is voluntary and that I can withdraw from the study at any time; I do not have to give any reasons for why I no longer want to take part and there will be no adverse consequences if I choose to withdraw.	☐	☐
How my information will be used during and after the project		
I understand my personal details such as name, phone number, address and email address etc. will not be revealed to people outside the project.	☐	☐
I understand and agree that my words may be quoted in publications, reports, web pages, and other research outputs. I understand that I will not be named in these outputs.	☐	☐
I understand and agree that other authorised researchers will have access to this data only if they agree to preserve the confidentiality of the information as requested in this form.	☐	☐
I understand and agree that other authorised researchers may use my data in publications, reports, web pages, and other research outputs, only if they agree to preserve the confidentiality of the information as requested in this form.	☐	☐

Name of participant [printed] Signature Date

Name of Researcher [printed] Signature Date

Project contact details for further information:

Researcher: Xiufeng Jia

Email: xiufeng@jiaxiufeng.com

Telephone (in China): to be updated later

The University's address: Department of Sociological Studies, Elmfield Building, Northumberland Road, Western Bank, Sheffield, South Yorkshire, UK, S10 2TU

If you would like to speak to someone rather than me regarding this research, please contact my supervisors:

Name: Professor Helen Kennedy

Email: h.kennedy@sheffield.ac.uk

Telephone: +44(0)114 222 6488

Name: Dr Kate Weiner

Email: k.weiner@sheffield.ac.uk

Telephone: +44(0)114 222 6491

Appendix 5 Participant Consent Form for Repeat Interviews

Everyday Digital Self-Tracking Practices in China: Variations, Feelings, and Sharing

Consent Form

Please tick the appropriate boxes	**Yes**	**No**
Taking Part in the Project		
I have read and understood the project information sheet dated 22/08/2019 or the project has been fully explained to me. (If you will answer No to this question please do not proceed with this consent form until you are fully aware of what your participation in the project will mean.)	☐	☐
I have been given the opportunity to ask questions about the project.	☐	☐
I agree to take part in the project. I understand that taking part in the project will include being audio-recorded interviewed.	☐	☐
I agree to take part in the project. I understand that taking part in the project will include sharing self-tracking materials with the researcher and then being interviewed.	☐	☐
I agree to take part in the project. I understand that taking part in the project will include sharing audio clips or text messages related to my self-tracking practices with the researcher, followed by a repeat interview.	☐	☐
I understand that my taking part is voluntary and that I can withdraw from the study at any time; I do not have to give any reasons for why I no longer want to take part and there will be no adverse consequences if I choose to withdraw.	☐	☐
How my information will be used during and after the project		
I understand my personal details such as name, phone number, address and email address etc. will not be revealed to people outside the project.	☐	☐
I understand my screenshots, audio clips or text messages, along with any informal chat messages shared with the researcher on WeChat may be used as research data in the researcher's thesis and other outputs.	☐	☐
I understand and agree that my words may be quoted in publications, reports, web pages, and other research outputs. I understand that I will not be named in these outputs.	☐	☐
I understand and agree that other authorised researchers will have access to this data only if they agree to preserve the confidentiality of the information as requested in this form.	☐	☐
I understand and agree that other authorised researchers may use my data in publications, reports, web pages, and other research outputs, only if they agree to preserve the confidentiality of the information as requested in this form.	☐	☐
So that the information you provide can be used legally by the researchers		

I agree to assign the copyright I hold in any materials generated as part of this project to The University of Sheffield.	☐	☐

Name of participant [printed] Signature Date

Name of Researcher [printed] Signature Date

Project contact details for further information:

Researcher: Xiufeng Jia

Email: xiufeng@jiaxiufeng.com

Telephone (in China): to be updated later

The University's address: Department of Sociological Studies, Elmfield Building, Northumberland Road, Western Bank, Sheffield, South Yorkshire, UK, S10 2TU

If you would like to speak to someone rather than me regarding this research, please contact my supervisors:

Name: Professor Helen Kennedy Name: Dr Kate Weiner

Email: h.kennedy@sheffield.ac.uk Email: k.weiner@sheffield.ac.uk

Telephone: +44(0)114 222 6488 Telephone: +44(0)114 222 6491

Appendix 6 Object-Elicitation Example


中国移动 4G
下午 9:28
45%
十二月
12月3日 周二
泳池游泳
已完成 102%
蛙泳（1,025米）
下午 7:11 - 下午 7:54
时间总计
0:43:39
距离
1,025 米
动态卡路里
305 大卡
总卡路里
352 大卡
平均心率
129 次/分
趟数
41
泳池长度
25 米
/100 米
/50 米
/25 米
平均配速/划水次数
4'11''/104
自动组合
记录
趋势
体能训练
奖章
共享


中国移动 4G
下午 7:23
33%
十二月
2019年12月4日 今天
一
二
三
四
五
六
日
12:00
6:00
12:00
6:00
总计 11 小时 15 分钟
站立
13/12 小时
12:00
6:00
12:00
6:00
0 小时未站立
步数
10,707
距离
7.7 公里
已爬楼层
3
体能训练
泳池游泳
1000 米
记录
趋势
体能训练
奖章
共享


中国移动 4G
下午 7:23
33%
十二月
12月4日 周三
泳池游泳
已完成 100%
蛙泳（1,000米）
下午 5:58 - 下午 6:43
北京市
时间总计
0:44:55
距离
1,000 米
动态卡路里
330 大卡
总卡路里
378 大卡
平均心率
129 次/分
趟数
40
泳池长度
25 米
/100 米
/50 米
/25 米
平均配速/划水次数
4'29''/122
自动组合
记录
趋势
体能训练
奖章
共享


中国移动 4G
下午 7:22
33%
十二月
2019年12月4日 今天
一
二
三
四
五
六
日
活动
674/400 大卡
119 卡
12:00
6:00
12:00
6:00
共 1,762 大卡
锻炼
74/30 分钟
记录
趋势
体能训练
奖章
共享


中国移动 4G
上午 11:19
77%
十二月
2019年12月5日 星期四
一 二 三 四 五 六 日
锻炼
64/30分钟
15分钟
12:00 6:00 12:00 6:00
总计10小时41分钟
站立
12/12小时
12:00 6:00 12:00 6:00
1小时未站立
步数
10,702
距离
7.4公里
已爬楼层
5
体能训练
记录 趋势 体能训练 奖章 共享


中国移动 4G
上午 11:19
77%
十二月
12月5日 周四
泳池游泳
已完成100%
蛙泳（1,000米）
下午 5:35 - 下午 6:22
北京市
时间总计
0:46:42
距离
1,000米
动态卡路里
324大卡
总卡路里
374大卡
平均心率
137次/分
趟数
40
泳池长度
25米
/100米 /50米 /25米
平均配速/划水次数
4'40"/119
自动组合
记录 趋势 体能训练 奖章 共享


中国移动 4G
上午 11:19
77%
十二月
2019年12月5日 星期四
一 二 三 四 五 六 日
活动
633/400大卡
105卡
12:00 6:00 12:00 6:00
共—
锻炼
64/30分钟
15分钟
记录 趋势 体能训练 奖章 共享


中国移动 4G
下午 9:36
69%
十二月
2019年12月9日 今天
一 二 三 四 五 六 日
活动
621/400大卡
108卡
12:00 6:00 12:00 6:00
共1,827大卡
锻炼
76/30分钟
15分钟
记录 趋势 体能训练 奖章 共享


中国移动 4G
下午 9:36
69%
十二月
12月9日 周一
泳池游泳
已完成100%
蛙泳（1,000米）
下午 7:39 - 下午 8:22
北京市
时间总计
0:42:53
距离
1,000米
动态卡路里
289大卡
总卡路里
335大卡
平均心率
133次/分
趟数
40
泳池长度
25米
/100米 /50米 /25米
平均配速/划水次数
4'17''/104
自动组合
记录 趋势 体能训练 奖章 共享


中国移动 4G
下午 9:10
71%
2019年
全部体能训练
体能训练
2019年12月
4次体能训练
泳池游泳
1,000米
今天
泳池游泳
1,000米
星期四
泳池游泳
1,000米
星期三
泳池游泳
1,025米
星期二

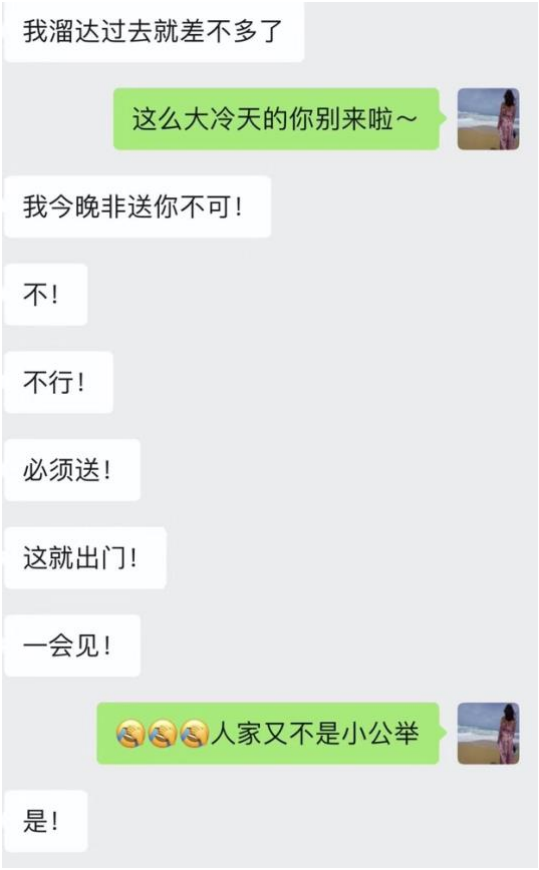

中国移动 4G
下午 8:55
18%
十二月
12月10日 周二
泳池游泳
已完成 112%
混合泳（50米）
自由泳（225米）
蛙泳（850米）
下午 5:00 - 下午 5:43
北京市
时间总计
0:42:20
距离
1,125 米
动态卡路里
318 大卡
总卡路里
363 大卡
平均心率
148 次/分
趟数
45
泳池长度
25 米
/100 米
/50 米
/25 米
平均配速/划水次数
3'43"/102
记录
趋势
体能训练
奖章
共享


中国移动 4G
下午 8:55
19%
十二月
2019年12月10日 今天
一
二
三
四
五
六
日
活动
587/400 大卡
113 卡
12:00
6:00
12:00
6:00
锻炼
70/30 分钟
15 分钟
记录
趋势
体能训练
奖章
共享


中国移动 4G
下午7:23
21%
十二月
12月12日 周四
泳池游泳
已完成102%
蛙泳（1,025米）
下午6:31 - 下午7:13
北京市
时间总计
0:41:41
距离
1,025米
动态卡路里
294大卡
总卡路里
339大卡
平均心率
140次/分
趟数
41
泳池长度
25米
/100米
/50米
/25米
平均配速/划水次数
3'58''/101
自动组合
记录
趋势
体能训练
奖章
共享


中国移动 4G
下午7:24
21%
十二月
12月23日 周一
泳池游泳
已完成150%
蛙泳（1,500米）
下午4:56 - 下午5:55
北京市
时间总计
0:58:26
距离
1,500米
动态卡路里
410大卡
总卡路里
472大卡
平均心率
147次/分
趟数
60
泳池长度
25米
/100米
/50米
/25米
平均配速/划水次数
3'53''/99
自动组合
记录
趋势
体能训练
奖章
共享


中国移动
下午 6:41
11%
十二月
2019年12月23日 今天
一 二 三 四 五 六 日
活动
712/400大卡
108卡
12:00 6:00 12:00 6:00
锻炼
85/30分钟
15分钟
记录 趋势 体能训练 奖章 共享


我溜达过去就差不多了
这么大冷天的你别来啦～
我今晚非送你不可！
不！
不行！
必须送！
这就出门！
一会见！
人家又不是小公举
是！


中国移动 4G
下午 7:24
21%
十二月
12月27日 周五
泳池游泳
已完成100%
蛙泳（1,000米）
下午 5:35 - 下午 6:18
北京市
时间总计
0:43:41
距离
1,000米
动态卡路里
292大卡
总卡路里
339大卡
平均心率
125次/分
趟数
40
泳池长度
25米
/100米 /50米 /25米
平均配速/划水次数
4'22"/107
自动组合
记录 趋势 体能训练 奖章 共享


中国移动 4G
下午 8:10
5%
十二月
12月30日 周一
泳池游泳
已完成101%
蛙泳（1,012米）
下午 5:27 - 下午 6:13
北京市
时间总计
0:45:46
距离
1,012米
动态卡路里
318大卡
总卡路里
367大卡
平均心率
124次/分
趟数
44
泳池长度
23米
/100米 /50米 /25米
平均配速/划水次数
4'50"/115
自动组合
记录 趋势 体能训练 奖章 共享


中国移动 4G
下午 9:10
71%
2019年
全部体能训练
体能训练
2019年12月
4次体能训练
泳池游泳
1,000 米
今天
泳池游泳
1,000 米
星期四
泳池游泳
1,000 米
星期三
泳池游泳
1,025 米
星期二
中国移动 4G
下午 7:24
21%
2019年12月
一 二 三 四 五 六 日
12月
1
2 3 4 5 6 7 8
9 10 11 12 13 14 15
16 17 18 19 20 21 22
23 24 25 26 27 28 29
30 31
1月
1 2 3 4 5
记录
趋势
体能训练
奖章
共享


中国移动 4G
下午 7:29
10%
一月
1月2日 周四
泳池游泳
已完成 102%
蛙泳（1,025 米）
下午 6:20 - 下午 7:05
北京市
时间总计
0:44:45
距离
1,025 米
动态卡路里
307 大卡
总卡路里
355 大卡
平均心率
136 次/分
趟数
41
泳池长度
25 米
/100 米
/50 米
/25 米
平均配速/划水次数
4'23"/110
自动组合
记录
趋势
体能训练
奖章
共享


中国移动 4G
下午 8:46
14%
一月
1月15日 周三
泳池游泳
已完成 120%
蛙泳（1,200 米）
下午 5:49 - 下午 6:33
北京市
时间总计
0:43:09
距离
1,200 米
动态卡路里
312 大卡
总卡路里
358 大卡
平均心率
140 次/分
趟数
48
泳池长度
25 米
/100 米
/50 米
/25 米
平均配速/划水次数
3'35"/95
自动组合
记录
趋势
体能训练
奖章
共享


中国移动 4G
下午 8:46
14%
一月
1月13日 周一
泳池游泳
已完成 100%
蛙泳（1,000 米）
下午 5:48 - 下午 6:26
北京市
时间总计
0:37:25
距离
1,000 米
动态卡路里
271 大卡
总卡路里
311 大卡
平均心率
142 次/分
趟数
40
泳池长度
25 米
/100 米
/50 米
/25 米
平均配速/划水次数
3'44"/100
自动组合
记录
趋势
体能训练
奖章
共享


中国移动 4G
下午 8:57
17%
回今天
2019年11月
分析
日 一 二 三 四 五 六
1 2
3 4 5 6 7 8 9
10 11 12 13 14 15 16
17 18 19 20 21 22 23
24 25 26 27 28 29 30
月经期 预测经期 安全期 易孕期 排卵日
大姨妈来了 是 否
爱爱 是 否
体温
体重
心情
日记
推荐 记录 发现 柚子街 我


中国移动 4G
下午 8:56
17%
记经期
19年12月
备孕中 怀孕了 育儿
分析
日 一 二 三 四 五 六
1 2 3 4 5 6 7
8 9 10 今天 11 12 13 14
15 16 17 18 19 20 21
22 23 24 25 26 27 28
29 30 31
你现在处于"我要记经期"状态哦～可切换其他状态
大姨妈来了 是 否
爱爱 是 否
体温
体重
心情
日记
推荐 记录 发现 柚子街 我


中国移动 4G
上午 8:24
100%
记经期
20年1月
备孕中
怀孕了
育儿
分析
日 一 二 三 四 五 六
1 2 3 4
5 6 7 8 9 10 11
12 13 14 15 16 17 18
19 20 21 今天 22 23 24 25
26 27 28 29 30 31
你现在处于"我要记经期"状态哦～可切换其他状态
大姨妈走喽
是 否
流量
痛经
爱爱
是 否
体温
体重
推荐
记录
发现
柚子街
我


00:03.50
Lv.30


R 拍摄画面
本日的运动结果
elaine
扭动手臂 512次(960次)
高举双臂扭腰 459次(699次)
推压Ring-Con 241次(1568次)
抬抬大腿 163次(2320次)
高举双臂晨式 145次(486次)
扭动上半身 94次(94次)
腿部开合 92次(161次)
扭转侧角姿势 79次(79次)
腹部推压 46次(277次)
深蹲 29次(307次)
腹部推压扭动 20次(442次)
拉开Ring-Con 16次(26次)
腹部推压深蹲 1次(2次)
抱膝式 1次(394次)
冲刺 428m(8834m)
慢跑 160m(5980m)
抬腿 18m(308m)
维持深蹲 138秒(205秒)
维持大腿推压 44秒(44秒)
水平推压Ring-Con 33秒(33秒)
维持拉开Ring-Con 23秒(549秒)
向上拉开Ring-Con 17秒(83秒)
维持向下推压Ring-Con 0秒(56秒)
括号内是开始游戏后的累积数值。


拍摄画面
本日的运动结果
elaine
合计运动时间
50分13秒
合计消耗热量
135.72kcal
合计行进距离
0.60km
下一步


心率
124次/分
运动强度
您的年龄为参考依据
*( )内为%HRmax
适当强度的运动 (65%)
以“燃烧脂肪”为目标。
如果目标是提高持久力，
不妨提高运动强度吧。
下一步


哈涅尔大瀑布的运动
运动时间
+9分51秒
消耗热量
+32.04kcal
行进距离
+0.41km
消耗热量与行进距离为大约的数值。
下一步


00:18.31