



**LUND**  
UNIVERSITY

# **The gamification of sleep**

A case study on user engagement with *SleepTown* in everyday(night) life

Author: Yukun You  
Msc in Media and Communication  
Lund University, 2020  
Supervisor: Helena Sandberg  
Examiner: Fredrik Schoug

## Abstract

Sleep is a crucial part of our lives, as we spend about one-third of our lives sleeping. In a digital age, mobile apps on smartphones play an important role in self-improvement regarding sleep. Gamification techniques can be particularly employed by app designers to strengthen users' motivation and participation. This thesis aims to take an empirical focus examining the ways in which gamification is adopted by mobile apps as a strategy to regulate users' sleep and affect their everyday(night) life. A case study on a mobile app - *SleepTown* is conducted to take a closer look at how people engage with sleep-regulating apps and make sense of their sleeping/gaming practices in the physical and virtual space, in the sleeping and waking world. The study is theoretically informed by the sociological perception of sleep, the interdisciplinary study of gamification, Foucauldian notions of governmentality and surveillance, media engagement theory, and Actor-Network Theory.

Through semi-structured interviews with twelve users, the author creates an understanding that the gamification strategy enacts a mode of governmentality, as users are recruited as willing participants who submit to monitoring in a gameful setting. The game mechanism of *SleepTown* creates a fun environment for users to regulate their sleep patterns under self- and mutual surveillance. Digital technologies have the agency to delimit the scope within which apps are designed with rules, while users can use their autonomy when engaging with the app in daily life. Their engagement with *SleepTown* varies in forms and in intensity. Users not only adapt to the game rules in varying degrees but also develop different tactics to satisfy their needs, constantly negotiating their relationships with the app, sleep routine, and daily practices. The interplay between the technological affordances and human users shapes the app function as well as the meaning of sleep. In the deep mediatized context, users' online and offline practices inspired by *SleepTown* construct sleep as an attractive experience associated with entertainment, social networking and consumption, and a task highlighting productivity and efficiency.

**Keywords:** gamification; sleep; mobile app; user engagement; *SleepTown*; digital technology; governmentality; surveillance; Actor-Network Theory

## **Acknowledgement**

I want to thank my supervisor Helena Sandberg for all the guidance and support during the whole process. Your literature tips and advice helped me explore new ideas about my topic and new ways to understand the user-technology relationship. Your feedback for my drafts encouraged me to improve the quality of my thesis constantly.

Thanks also to Magnus Andersson, whose lecture inspired me to explore the counterproductive time management and productivity apps, and to Annette Hill, for advice for digital detox and the encouragement.

A big thanks to all the participants in the interviews and people who helped me recruit interviewees. Thanks to all the interviewees for sharing your interesting stories and views with me.

Thanks to my MKV classmates and friends for literature suggestions and feedback.

I must express my gratitude to my family and friends for providing me with continuous support and encouragement throughout my years of study and during the process of thesis writing. I am so lucky to have you amazing people in my life!

## Table of Contents

<b>Introduction</b> .....	<b>6</b>
Building a <i>SleepTown</i> .....	7
Aims and research questions.....	9
<b>Reviewing sleep and gamification</b> .....	<b>10</b>
Sleep as a problem.....	10
<i>The medicalization of sleep and healthism</i> .....	11
<i>The commodification of sleep</i> .....	12
<i>The digitalization of sleep and mobile apps</i> .....	13
Gamification as a solution .....	15
<i>Gamification and governmentality</i> .....	16
<i>Gamification and surveillance</i> .....	18
Engaging sleep in everyday life.....	19
<i>Productivity and digital detox</i> .....	20
<i>Human and non-human agency</i> .....	21
<b>Qualitative research on <i>SleepTown</i></b> .....	<b>23</b>
Methodological approach.....	23
Doing qualitative interview.....	25
Analyzing the data .....	27
Critical reflections.....	28
<b>Constructing a <i>SleepTown</i> in everyday(night) life</b> .....	<b>31</b>
Gamification and sleep regulation .....	31
<i>Feedback mechanism</i> .....	31
<i>Mutual surveillance</i> .....	38
<i>Technological affordances</i> .....	41
<i>SleepTown</i> in everynight(day) life.....	43
<i>Sleep routine</i> .....	44
<i>Daily practices</i> .....	47
Conformity, negotiation, and resistance .....	52
<i>Regulating sleep</i> .....	53
<i>Managing functions</i> .....	54
<i>Playing a game</i> .....	55
<i>Taking or losing control</i> .....	57
<b>Conclusion</b> .....	<b>60</b>
Regulating sleep in a gameful environment.....	60
‘Doing’ sleep in everyday life .....	62
Making sense of sleep in a digital age .....	63
<b>References</b> .....	<b>66</b>
<b>Appendices</b> .....	<b>72</b>
Appendix 1: Lists of interviewees.....	72
Appendix 2: Consent form.....	73
Appendix 3: Interview guide.....	74
Appendix 4: An example of interview transcript.....	76
Appendix 5: An example of coding process .....	81
Appendix 6: Examples of spider map.....	82
Appendix 7: Examples of mind maps .....	83
Appendix 8: The screenshot of recruitment advertisement on <i>Weibo</i> .....	84

## Figure content

Figure 1 A normal building .....	32
Figure 2 A rare building.....	32
Figure 3 <i>The Big Town</i> (Interviewee <i>Y</i> ).....	32
Figure 4 Zooming in on the building.....	33
Figure 5 The dream architecture (Interviewee <i>Q</i> ).....	33
Figure 6 The interface of <i>Buildex</i> .....	34
Figure 7 The interface of <i>Achievements</i> .....	34
Figure 8 The industrial zone (Interviewee <i>W</i> ).....	36
Figure 9 Districts divided by color (Interviewee <i>Q</i> ).....	36
Figure 10 The destroyed building.....	36
Figure 11 The destroyed building in <i>The Big Town</i> .....	37
Figure 12 The destroyed building in weekly data .....	37
Figure 13 <i>Wonders</i> in <i>The Big Town</i> .....	39
Figure 14 The interface of <i>Circle</i> (Interviewee <i>Y</i> ).....	39
Figure 15 The industrial Town (Interviewee <i>D</i> ).....	48
Figure 16 The town plan (Interviewee <i>D</i> ).....	48
Figure 17 The original building in <i>SleepTown</i> (Interviewee <i>Q</i> ).....	49
Figure 18 The user-made <i>SleepTown</i> -style building in <i>Minecraft</i> (Interviewee <i>Q</i> ).....	49

## Introduction

There is a close relationship between sleep and media. People can use media to stay awake or to fall asleep. For example, drivers listen to the car radio to not fall asleep behind the wheel. At night, people listen to the broadcast of music or read a novel to relax and get ready for sleeping. There are TV programs specifically designed to help children fall asleep (Zimmerman 2008). Electronic and digital media in particular play an important role in people's sleep practices. On the one hand, media can function as a sleep aid. Students' sleep problems may be reduced after listening to relaxing classical music (Harmat, Takacs and Bodizs 2008). Sleep-related information on the Internet provides lay people with a resource to improve sleep so as to empower the general public (Dement and Vaughan 2000). On the other hand, media can be inhibitors of sleep. For instance, the presence of digital media devices in the bedroom makes it more convenient for users to access online information and connect with others, thus increasing their media usage (Exelmans and Van den Bulck 2019). The negative effects of media use on sleep patterns, such as the delayed bedtime, shorter sleep duration, longer sleep latency, increased daytime fatigue, night awakenings and nightmares (ibid.), are discussed by media scholars and are widely spread in everyday life. In this sense, sleep is not just a gift but also a problem for many people. Sleep problems can result from the pervasiveness of digital and mobile media. When it comes to roles in sleep-related matters, media can be 'advocate or critic', 'sponsor or saboteur' at the same time (Williams 2005: 154).

Sleep is both a biological necessity but also a concept endowed with meaning and practices in a social context that can change depending on historical, social and cultural factors (Williams et al. 2011: 294-295). In the digital age, people can be empowered by digital media technology and mobile devices in order to monitor and optimize their 'unconscious' part of life, like sleep. Nowadays, an especially interesting shift in sleep habits is occurring with the boom in digital self-regulating devices and mobile applications. Sleep is not only mediatized, medicalized and commodified (Williams 2005) but also digitalized (Lupton 2018) and gamified (Ilhan et al. 2016). Sleep experiences have been gamified by self-monitoring apps, meaning gamification becomes an effective strategy for regulating sleep, attracting and enhancing users' engagement in a non-game context (Deterding et al. 2011).

The gamified technology has created a shift from sleep as only biological, inactive and private

to possibly digital, active and public, as the game allows users to act, achieve goals and be surveilled by others in the virtual space while they sleep. It is the new shift that not only influences users' sleep routine such as how to sleep and when to sleep, but also implies power struggles between app designers and media users, users and users, between individuals and broader social structure.

Scholars have done relevant researches in the fields of gamification, sleep, digital technology, etc. For instance, the volume edited by Walz and Deterding (2014) embodies the rhetoric and debates on games and gamification in everyday life. Approaches from different disciplines, issues like exploitation and privacy, and application domains such as health and social media, are examined. Lupton (2016, 2018) has offered critical and cross-disciplinary perspectives to look into the possibilities and risks created by digital health technologies. Kelly, Strecker and Bianchi (2012) have explored recent developments of domestic sleep-monitoring devices, while Williams, Coveney and Meadows (2015) have discussed the transformation in tracking and managing sleep of ourselves via mobile apps in the age of sleep 2.0.

However, existing studies tend to focus on gamification and digital health in general, leaving the specific gamification of sleep based on digital media overlooked. There is a need for a social science view on gamified sleep in the digital age, because sleep practice now is not just a normal biological necessity but also an important reflection of the deep mediatized social world (Couldry and Hepp 2017). Media and communication studies have much to contribute to an understanding of sleep, both now and in the future, shedding new light on the media and social dimensions of sleep. Sleep, constructed as a site for self-enhancement and gaming, enacted well in both physical and digital space, can indicate the knowledge scope of body and health which is deeply shaped by technologies and the need for entertainment. The thesis will produce new knowledge on the gamification of sleep among Chinese app users<sup>1</sup> and contribute to the intersectional study of gamification and digital health.

### **Building a *SleepTown***

To better understand gamified sleep via mobile apps, it is helpful to conduct a concrete case

---

<sup>1</sup> I chose Chinese app users due to my Chinese background and personal interest.

study on an app with game features. Hence, I want to focus on a sleep app called *SleepTown* (睡眠小镇), created by *Seekrtech* (时刻科技)<sup>2</sup>, adopting unique and attractive game elements to help users regulate their sleep-wake cycles and get rid of mobile distractions from sleep, in order to *build healthy sleep habits*<sup>3</sup>. *SleepTown* is a commercial product. To download and use all the functions of the app<sup>4</sup>, users pay 12 *yuan*.

According to the app introduction in Apple App Store, the basic rule of *SleepTown* is simple and fun: set bedtime and wake-up goal, go to bed and get up in time to construct *buildings* and create your own *Town*. If the goal is achieved consistently, the player will have chances to construct *rare buildings*, unlock *Achievements*, get more money to expand blocks and buy decorations, etc. However, the building under construction will *collapse* if you fail, that is, you destroy the building if using the phone during sleep time or if you wake up too late. In addition, the function of *Circle* allows players to form a ‘sleep group’ and build a big *Wonder* together, by following the same sleep-wake pattern. There are also in-app settings or tools such as *Strict Mode*, *Bedtime Reminder*, *Ambient Sound*, and *Shaking Challenge*<sup>5</sup> that help users put down phones, prepare for sleep, and wake up on time.

There are five functions of *SleepTown*: beating phone addiction, maintaining regular sleep schedule, collecting sleep statistics, building communities, and entertainment. Hence, *SleepTown* combines features of productivity apps (manage time), health apps (regulate sleep), and digital games (have fun). However, different objectives of productivity apps and games can lead to contrary effects on people’s media use. Productivity apps aim to help users arrange schedules, workloads, and activities, to achieve better time management (Gregg 2018: 79). This kind of apps often limits users’ phone use, by forcing them to avoid digital distractions and focus on tasks in real life. Rather, digital games require people’s phone use. Players are attracted by fun game mechanisms and immerse themselves in the virtual environment. Users are in fact encouraged to spend more time on their digital devices. Cell

---

<sup>2</sup> *Seekrtech* is a Taiwanese technology company (<https://seekrtech.com/en/>), famous for apps of *Forest* (a productivity app that helps user put down phones and stay focused) and *SleepTown*.

<sup>3</sup> See more official information about *SleepTown*: <https://SleepTown.seekrtech.com>

<sup>4</sup> Android users can download the app and use the basic function of the app for free. If they want to get coins and tickets, unlock *Achievements*, build a *Circle*, etc, they have to fully pay. However, IOS users are not offered such a choice. They pay for it when downloading the app. (All interviewees have paid for the app)

<sup>5</sup> If users turn on *Shaking Challenge*, they have to not only click the ‘wake up’ button in the morning but also shake their phones for a while to complete the building. The levels of challenge can be changed according to their needs. *Shaking Challenge* can prevent some users from ‘gluing’ themselves to bed and making them quickly and completely awake.



phone distraction can be the cause as well as the result of using *SleepTown*.

It seems contradictory that *SleepTown* encourages users to put down their phone on the one hand, and endorses its service based on digital media and devices on the other hand. Moreover, users might have conflicting thoughts and experiences of digital media use and overuse (Syvertsen 2020: 9). Their personal stories can tell us not only something about individual practices and tactics dealing with different functions of an app but something about living in a media-saturated society. Thus it is important to listen to the real users' voices. This requires me to conduct an audience study to get closer to users' engagement with the app and to find out how users understand their app use in everyday(night) life.

### **Aims and research questions**

I aim to explore the gamification of sleep at a micro level by looking into the relationship between the app *SleepTown*, sleep, and users' practices in everyday life. In particular, I want to look into the gameful mechanism in *SleepTown*, and how it works to regulate users' sleep. By conducting qualitative interviews with app users, I want to understand users' diverse engagement with the app and their perceptions about smartphone use and sleep regulation, revealing the power relations between the human and non-human objects in the process of 'doing' sleep. By investigating the gamification techniques and users' mediatized everyday/night sleep-related practices, light can also be shed on what meanings are ascribed to sleep in a digital age.

The research questions are:

1. How does *SleepTown* adopt gamification as a strategy to regulate people's sleep?
2. In what ways do users engage with *SleepTown*, and understand their sleeping/gaming experiences in everyday(night) life?
3. How is the meaning of sleep shaped by *SleepTown* and the users' practices?

## **Reviewing sleep and gamification**

The development of digital media technology has opened up significant new problems and prospects for self-monitoring of sleep (Williams et al. 2015). New digital forms of biosociality and communities of practices emerge, and wider questions of control, surveillance and resistance appear in the digital age (ibid.: 1050). It is vital to understand what digitalization and gamification of sleep mean to people in the context of their everyday lives.

In this chapter, I will introduce the theoretical framework of the thesis and situate it with previous research. The literature review is divided into three parts: First, I will show how sleep is medicalized and depoliticized as an individual problem, how the commodification of sleep is promoted, and what role mobile apps play in the process of digitalization of sleep. Second, I will use foucauldian theories and gamification theories to look into the function of gamification strategy and its relationships with governmentality and surveillance. Last, I will discuss users' engagement with sleep regulation, productivity improvement and digital detox, and inspired by Actor-Network Theory, how user-technology relationships are (re)configured in the process.

### **Sleep as a problem**

Sleep is a multidimensional phenomenon that cannot be reduced to a single biological, psychological, or social domain (Williams 2005; Williams et al. 2011; Crossley 2004). Many scholars have shed light on the socially constructed aspect of sleep. Williams (2005) argues that sleep is a complex practice that shows 'a high degree of socio-cultural plasticity or variability' (ibid.: 3). The meaning and practice of sleep can change depending on historical, social, and cultural context (Williams et al. 2011: 294). Not only social and cultural factors but material, symbolic, corporeal and aesthetic criteria affect the way of 'doing sleep' (Taylor 1993). Moreover, the sleeping world is not isolated but rather depends on and interacts with the waking world. As Crossley (2004) suggests, sleep is negotiated through a network where actual and virtual social circles intersect and influence each other. Sleep only makes sense when situated in the context of people's everyday/everynight lives. To understand sleep better, researchers should pay attention to people's social roles and lives as well as social networks in

which sleep is embodied and embedded (ibid.). Generally speaking, sleep has a fundamental influence on the society. All societies face the problem of how to organize the sleeping and waking life of their members. Either 'too much' or 'too little' sleep poses a threat to the productivity and social order. In this sense, sleep is not just an individualized and private behavior but a socially controlled and institutionalized practice (Williams 2005).

### **The medicalization of sleep and healthism**

The impact of medicine and medical concepts has expanded enormously in social domains, and therefore a number of life problems have been defined as illnesses or disorders (Conrad 2007). The term of medicalization describes the process by which non-medical problems become defined and treated as medical problems (ibid.). Certain behaviors or common life processes such as eating and sleeping, anxiety and mood, have been medicalized. Critics suggest that (over)medicalization transforms every aspect of everyday life into pathologies, narrowing the range of acceptable behaviors (ibid.: 7). Institutions or people who have the authority to define certain behaviors, persons and things, play significant roles in medicalization of society. In recent years, big corporates, media, and even individual consumers, become important advocates for medicalization and healthism, boosting the sleep market and the commodification of sleep.

Healthism describes the phenomenon that well-being is primarily defined and achieved by personal health care, and people can reach this goal by modifying their lifestyles (Crawford 1980). Healthism, as a pan-value, is a form of medicalization (ibid.: 381). As a growing number of behaviors and social phenomena are judged by the standard of 'health', health is generalized as the struggle for well-being in every aspect. In healthist utopian imagination, health is the essential value, and everything can be problematized and medicalized in the name of health. Moreover, healthism is an ideology that emphasizes lifestyle choices and individual responsibility for health. Both causes and solutions can be situated and formulated at individual level. Health problems like phone addiction may be caused by external factors, but since these problems are behavioral, solutions are seen to rest within the individual's determination.

The notion of 'sleep hygiene' (Dement and Vaughan 2000) is useful to understand the impact of healthism on sleep habits. The principles and practice of sleep hygiene focus on behavioral

elements, requiring people to be responsible for teaching themselves about sleep (ibid.:15). Keeping a regular sleep pattern is one of the most important behaviors for healthy sleep (ibid.). Personal behavior, motivation and emotions should be taken good care of by individuals. People are encouraged to plan their lives, including sleeping, in the name of well-being. In a broader sense, new forms of governmentality and surveillance are produced ‘in the name of health, happiness and the wisdom and virtue of a well-slept life’ (Williams 2005: 154).

People benefit from and are hurt by highlighted individual responsibility. On the one hand, self-responsibility indicates a reclaim of personal power. It delegitimizes medical authorities and empowers lay people to be active subjects (Crawford 1980: 377). On the other hand, the focus on individual responsibility weakens the social effort to improve health and well-being (ibid.: 368). Social constraints that limit personal choices are overlooked. For example, there are structural reasons behind sleep disorder and insomnia that cannot be easily changed by an individual. When individuals are isolated from the social context, they tend to blame themselves for not staying in good health instead of the environment. Self-responsibility can lead to self-blame (ibid.: 380), reinforcing the victim-blaming ideology and posing more threat to the sick sleepers.

### **The commodification of sleep**

People’ attention to health and their obsession about self-care contribute to commercialization and consumption of sleep. Sleep is now a big business, as a great number of products and services are sold and consumed in the name of (good) sleep (Williams 2005: 165). The pursuit of productivity in the fast-paced society not only leads to people’s sleep problems (e.g. sleep deprivation, insomnia), but also plays an essential role in people’s self-management of sleep-wellness. In other words, capitalism disrupts and guarantees people’s sleep at the same time. Capitalism makes profits from people’s wakefulness and sleep (ibid: 160): When people are awake, their surplus value can be exploited by overworking. When people are ready to sleep, they are convinced to pay for the sleep-optimizing product or service, ensuring the next-day productivity. People are thus labor as well as consumers in the day/night circle. To some extent, sleep is no longer a biological necessity that everyone consumes, but a new commodity what neoliberal capitalism sells back to people (Urquhart 2018). Only those who can afford and would love to purchase the commodity will be granted good sleep.

Existing literature pays more attention to the waking life of consumers than the sleeping, but some scholars identify sleep as a form of consumption and analyze the relationship between sleep, desires and consumers. For instance, Valtonen and Moisander (2012: 436) argue that ‘sleep-as-consumption’ is constructed as a particular mode of being. Through commodification, sleep is transformed to a marketable entity with economic value (ibid.: 438). ‘Great sleep’ or ‘super sleep’ are fantasies created by consumer culture in which new kinds of fun and feelings are produced by consumers’ desires. When sleep is aligned with entertainment and excitement rather than necessity and passivity, sleepers as consumers are allowed to manage and maximize their attempts to sleep well and to wake up energized (ibid.: 436). ‘Great sleep’ is not recognized as an illusion but is normalized as a culturally acceptable behavior and an attractive experience that consumers can achieve by purchasing specific products or service. Hence, ‘great sleep’ is legitimized as an object of consumer desire and is thus commodified in consumer culture. The rapid growing ‘sleep aids market’ (Williams 2011: 145) and the prevalence of sleep-related products and services illustrate the case. Discursive and practical knowledge regarding sleep is also produced and spread in and out of the media and the market, shaping peoples’ understanding and practice of sleep.

### **The digitalization of sleep and mobile apps**

The past two decades have witnessed a growing turn to sleep matters especially the issue of sleep, culture and health (Henry et al. 2013). The digital technologies that have emerged in the wave of Web 2.0 create more opportunities for people to access, share health-related information and experiences with each other in digital forums (Lupton 2014). Lay people not only consume Internet content but also produce knowledge regarding health and well-being. The ideal of the ‘digitally engaged patient’ or the ‘e-patient’ becomes dominant in the age of digital ‘prosumption’ (ibid.: 608). Lay people and patients are empowered by digital technologies to ‘take control’ over their health and bodies. They can use and contribute to online information, engage in constant self-tracking and self-care practices (Lupton 2016).

A number of new digital products are available for monitoring and managing our sleep, shaping our knowledge about the self and body. The use of sensors becomes a pivotal feature of contemporary self-tracking technologies (Lupton 2016). Some devices are promoted as a tool for sleep analysis and improvement, generating and classifying data into wake, rapid eye movement (REM) sleep, light and deep non-rapid eye movement (NREM) sleep (Kelly et al.

2012). Some accelerometer-based devices serve as smart alarms to monitor sleep stages and wake people up at the optimum time (Williams et al. 2015: 1044). The user-technology assemblage is configured through people's usage of sleep-regulating technologies. Users as lay people do not have to rely on experts in the clinic to actualize sleep-monitoring. They can collect information of their dormant body via self-tracking technologies. People can become more self-responsible and motivated to improve their sleep and health. Sleep thus becomes a site for optimization enacted beyond the clinical sphere.

Mobile software applications have become an important element of contemporary digital technology use (Lupton 2014). Due to the mobile digital developments (m-Health), people can track their sleep, share data with professionals and others, participate in online groups, collect and make use of relevant information to optimize their sleep (ibid.). There is a new important digital dimension and dynamic to the debates in the form of new technologies to monitor or 'm-app' (as in mobile-app) the 'sleep of ourselves' in everynight/day life (Williams et al. 2015). Anyone who is willing to take their phone to bed is able to monitor their own sleep (ibid.). Some apps targeting patients who suffer from sleeping disorders focus on the scientific management of the problem, delivering cognitive behavioral therapy, and arranging meetings with clinicians. Some apps targeting self-trackers who do not have severe sleep problems, mainly help users record their sleep, and generate data about their sleep patterns. Some apps like *SleepTown* targeting phone addicts, do not collect much data from users' sleep but urge them to put down their phone and go to bed early.

The genre of health and medical apps plays a vital role in contemporary care and health practice, and contributes to the notions of health, illness and embodiment (Lupton 2014). Mobile apps are digital technologies but also 'sociocultural products located within pre-established circuits of discourse and meaning' (ibid.: 610). Political values of healthism can be ascribed to self-tracking apps, championing behavioral conventions and individual responsibility for self-care. Apps are considered to assume certain kinds of capabilities, desires and embodiments, but also construct and configure them (ibid.). They can actively produce new practices and knowledge about the self, shape human bodies, and reshape the relationship between technology, health and culture.

## **Gamification as a solution**

In general, gamification means the use of game design elements in non-game contexts (Deterding et al. 2011: 9). In a practical sense, gamification is defined as the process of using game thinking and game mechanics to solve problems and engage users (Zicherman 2011). Today, due to the development of digital technology and infrastructure, gamification is commonly used in self-tracking products and services to advance users' involvement (Raessens 2014). Different from 'playing' or 'play', 'gaming' and 'games' are characterized by rules and competition of actors towards goals or outcomes (Deterding et al. 2011: 11). Besides explicit rules and goals, a feedback system is a necessary component of a game. The feedback system takes forms of 'points, levels, badges, a score or a progress bar', telling players 'how close they are to achieving the goal' (McGonigal 2011: 21). The game elements are often distinguished from open, exploratory and free play. Yet, the boundary between 'game' and 'gamified applications' can be blurry. The boundary is empirical, subjective and social, depending on how the user 'use' or 'play' it (Deterding et al. 2011: 11). In some cases, users' experiences can turn a merely gamified application into a serious game (e.g. some users treat *SleepTown* as a pure game for fun without following the sleeping rule).

Different scholars have different opinions about gaming and its application (gamification). Some game theorists place a great value on gamification. McGonigal (2011) for example regard gamification as a vital solution to existing social problems. She identifies four types of rewards that people can get through gaming: satisfying work (achieve blissed productivity), experience/hope of being successful, social connections, and meanings (inspire awe). The four characteristics of game echo human needs related to happiness and well-being. McGonigal thus calls for the construction of alternative realities by which people can live in and interact with the world in new and more gameful ways (ibid.: 112).

However, some scholars stay alert and critical to the capitalist goal of wealth accumulation behind gamification. Bogost (2014) argues that gamification is merely a consulting style that irresponsible consultants use to deal with customers' problems. It offers a simplest and fastest route to get things done and make profits (ibid.: 68). That's why gamification is primarily valued and promoted by business folk rather than designers or researchers (Rey 2014).

Gamification can be seen as one mechanism that serves the post-Fordist economy based on consumption, leisure and flexibility (ibid). Fun, as a ‘carrot dangled before the highly programmed masses’ (ibid.: 280), renders post-Fordist subjects as ‘dupes’ that can be easily fooled and exploited. There are also scholars in between, admitting both the benefits and risks of gamification. For example, Sicart (2014) argues that playing a good life, supported by computer technologies, is a way of living good life, but not every game design is ‘a conduit of a good life’ (ibid.: 226). A good life is constructed based on expression and reflection through action. We should constantly act and reflect on ourselves to develop our best being.

### **Gamification and governmentality**

Gamification makes it possible to motivate intended behavior effectively in a pleasant way. The use of gamification has been common in schools and workplaces for years (Fuchs 2014). What is new today is the degree to which gamification techniques can be put to use in a digital age. Driven by the gameful elements, people voluntarily engage with self-tracking apps and mobile devices, and consciously turn specific life processes into experiences or events that can be fetishized and consumed. In the process of self-optimization, a new mode of governmentality appears and functions effectively through the designed options and gameful setting, to regulate people’s behavior.

Foucauldian theories are helpful to understand the discursive construction of sleep-related reality. Foucault invented the term ‘governmentality’ combining ‘government’ with ‘rationality’ (Foucault et al. 2007). He defines government as ‘the conduct of conduct’, that is, ‘a form of activity aiming to shape, guide or affect the conduct of some person or persons’ (Foucault et al. 1991: 2). Government is an activity involving not only relations concerned with political sovereignty and relations between communities and social institutions, but also interpersonal relations and relations between self and self (ibid.). Foucault uses ‘art of government’ to explain the ‘rationality of government’. Rationality in this case means a system of thinking about the nature of the practice of government (who governs whom or what and in what ways). It indicates that there must be pre-defined rules that people can act on and thus individual behaviors can be managed or controlled. Nonetheless, people are able to alter the direction of the conduct of the governed. Hence, government is an art that requires people’s knowledge and skills of administration and management. What’s more, Deleuze (1992) extends Foucault’ analysis of governmentality further. It is important to think about



how governmentality is enacted when the social control is automated by technology and individuals are reduced to malleable ‘dividuals’ formed by data (ibid.). Operation nowadays is not only disciplined through surveillance and normalization, but also controlled by consumption and desire (Whitson 2014: 343). The commodification and commercialization of sleep reflect this new mode of governmentality.

There is also a close relationship between governmentality and neoliberalism. Allocating responsibility for social problems to individuals is a part of neoliberal agenda (O’Malley 2009). As neoliberalism encourages people to govern themselves, governmentality in this case instills a wish into people’s mind to control their behaviors for the benefit of the state. The notion of ‘ideal healthy citizen’ and people’s active participation in self-care perfectly exemplify this phenomenon (Lupton 2018). In this sense, governmentality defines the willing participation of the governed that is based on the active consent of the general populace.

Inspired by Foucault, Schrape (2014) argues that techniques of gamification represent an emerging new mode of governmentality based on digital infrastructure and technology. Gamification, as a method to regulate people and society, constructs the subject as a free player in a limited rule-space. In this sense, gamification practices Foucault’s idea of ‘neoliberal governmentality’ to the extreme. Freedom and regulation go hand in hand in the gamified setting. In particular, Schrape argues that gamification belongs to the category of ‘positive feedback’ (ibid.: 30). For him, gamified elements such as points and badges are positive feedback, while punishment and deterrence are negative feedback techniques. For positive feedback, the promise of status and exclusiveness represented by game levels is a driving force of motivation. More importantly, the public visibility of status and loyalty rewards is one of the conclusive traits of gamification (Zichermann and Cunningham 2011: 9). Product or service usage is compressed into public visible signs (e.g. badges, points, levels). The structure of status signs and privileges can create an artificial hierarchy that is protected through means of surveillance and discipline. Although Schrape identifies the effective behavior regulation via positive feedback, he fails to take gamified negative feedback into consideration. For example, visual representation of failure, dropped ranking, being kicked out from a community, can be virtual punishment in the gamified environment. Therefore, gamification in fact adopts both positive and negative feedback techniques.

The concept of ‘libertarian paternalism’ (Thaler and Sunstein 2008) is also helpful to

understand the relationship between freedom and regulation. Libertarian paternalism means that subjects are allowed to choose options freely, but all the options are designed in a way that they will decide in an intended way (ibid.). For example, *SleepTown* adds the setting of *Strict Mode* and allows users to be distracted by the phone for a while (freedom). However, the mode also reminds users that they should or are expected to follow the game rule and keep a regular sleep schedule (intended behavior). Otherwise, users will cheat themselves. In this case people are willing to act according to what the app favors. Therefore, in a gamified setting, rules or limitations of the game mechanism are ignored or well-justified, fostering the player's illusion of freedom and autonomy. Even though people are not forced to play the game, once they play, they have to obey the rules.

### **Gamification and surveillance**

The prevalence of gamification indicates the power of 'soft' persuasion regarding people's behaviors. The carrot beats the stick at the expense of total surveillance (Schrape 2014: 21). The development of online communication and Internet economy allows geographically dispersed individuals, groups, or institutions to interact with one another easily. With this background, gamification strategies can encourage people to engage in self-surveillance and mutual surveillance (Lupton 2018: 38).

Gamification makes the process of self-surveillance more fun and less medical. Self-tracking, as a product of the ever-quantifying society, introduces self-surveillance in terms of health. Self-trackers gain a sense of control as well as pleasure when using gamified tracking products or services. They are motivated to enjoy features such as rendering everyday lives into metrics and images, checking visualization of the data, comparing metrics with others or with previous data, sharing these data on social media, etc (ibid.). Uploading intimate details of one's life to the social media, indicating that gamification of quantified self breaks down the oppositions between private space and public space (Whitson 2014: 349). The relationship between the public and the private is significantly altered by digital surveillance. Moreover, self-trackers voluntarily offer information about themselves that can be transformed and branded into information capital (Maturo and Moretti 2018: 91). They can get certain benefits by sharing personal information, nurturing modern surveillance and a new mode of control enhanced by digital media (ibid.). New asymmetries between information collectors (e.g. high-tech company) and providers (e.g. users) are also created.

Mutual surveillance can constitute a part of game mechanism. Andrejevic (2005) uses the word ‘interveillance’ to refer to the surveillance conducted by peer-to-peer monitoring. For example, social media is one vital place to exercise interveillance. Three forms of routinized social monitoring and self-expression are integrated in social media platforms: watching and judging networked Others, watching Others watching oneself, and watching one’s own data double - the hypermediated Self (Christensen and Jansson 2015: 1480). Social media in this case can be institutions that are ‘panoptic’ and ‘synoptic’ at the same time (Lupton 2018: 23): you are able to observe others while others can gaze at you as well. The combined model of ‘panopticon’ (Foucault 1975; Bentham 1843) and ‘synopticon’ (Mathiesen 1997) can be adopted by self-tracking apps as a way to empower and limit every user’s behavior.

### **Engaging sleep in everyday life**

As sleep involves a loss of waking consciousness, we can only know and understand it indirectly, through others’ eyes (what Foucault termed ‘medical gaze’ in 1973) or technologies (e.g. wearable devices embedded with sensors). It is recognized that technologies are developed to ‘monitor, quantify, assess, track, visualize sleep’, from polysomnograph (PSG) to sleep-related apps (Williams et al. 2015: 1040). The rapid growth of home technologies for observing and measuring diseases and health contributes to the shift of sleep-monitoring - from mapping the sleep of ‘others’ in the sleep lab or clinic (Kroker 2007) to tracking the sleep of ‘ourselves’ at home (Williams et al. 2015). Our sleeping practices are influenced by the increasing digital technologies that monitor and measure sleep.

Mobile apps as software can be seen as digital media based on mobile devices. The notion of media engagement is helpful to explore users’ feelings and thoughts about the app and their daily experiences. Corner (2011) argues that engagement varies in intensity, depending on cognitive and affective work by audiences. The affective work of engagement is connected with one’s subjectivity and feelings, while the cognitive work is related to critical appreciation and genre knowledge, storytelling, aesthetics and style (Hill 2017: 6). Extending Corner’s idea, Hill (2017) points out that there is a spectrum of engagement that ‘captures the dynamic movement across the cognitive and affective work of audiences, highlighting the

different positions and intensities of engagement' (ibid.: 7). There are affective and critical modes in the spectrum, and audiences can switch between positive and negative engagement, to disengagement (ibid.: 8). For example, when people's intimate physiological states are constantly scrutinized, measured, and parameterized, some of them may feel empowered through self-optimization, while others may regard self-tracking more a social obligation than self-empowerment. When people's feeling of 'being forced' beats the fun they get from the game, users may disengage with the app temporarily or permanently.

### **Productivity and digital detox**

According to Apple App Store, *SleepTown* is introduced as an app helping users feel energetic and vitalized. It helps users improve productivity in the daytime, by managing their sleep at night. Hence *SleepTown* and productivity apps have similar traits. Gregg's (2018) ideas about productivity apps are useful to understand how the meaning of productivity is ascribed to app design and how the apps affect people's work. Nowadays principles regarding productivity spread from workplaces to every other aspect of life. Big corporates use tracking apps to motivate employees to stay healthy and productive, while individuals use self-monitoring services to motivate themselves to work efficiently. Thanks to productivity apps, methods of time management such as taking notes and arranging tasks are transformed into an embodied and daily practice (Gregg 2018). In particular, an 'aesthetics of activity' is generated by productivity apps (ibid.: 82). Software can employ minimalist design such as unique color schemes and clutter-free interface, to invoke the value and pleasure when people get things down. Nevertheless, productivity apps can enable 'too much activity' (ibid.: 85), as users express creativity in the efficient management tasks continuously. Regarding work content, *SleepTown* share similar deficiency with productivity apps, as they both emphasize that 'process trumps content' (ibid.: 86). Productivity apps are often promoted for its capabilities - 'synchronicity, smart, and seamless' (ibid.), while the material realities of work that requires action are overlooked. Similarly, *SleepTown* highlights the importance of regular sleep, but says nothing about the sleep quality. Obviously, keeping a regular sleep schedule doesn't guarantee a good sleep.

The pursuit of productivity makes people reflect on how to allocate their time. Syvertsen's (2020) explanation of digital detox is useful when analyzing people's resistance to media and technology in an acceleration society. Digital detox is defined as a 'periodic disconnection

from social or online media, or strategies to reduce digital media involvement' (Syvertsen and Enli 2019). In a world with ever-increasing information, the emphasis of digital detox shifts from improving the media (e.g. restrict media content) to improving the user (e.g. limit personal media involvement) (Syvertsen 2020). Besides fighting against addiction, there are three dominant motives for digital detox: presence, productivity and privacy (ibid.). Detoxers want to reclaim the authenticity of presence and here-ness by enjoying missing out. They also commonly talk about the loss of productivity and concentration and procrastination due to digital overuse. The concern about the use, sale, and misuse of personal data is another impetus for people limiting and resisting digital media and online services. According to Syvertsen, digital detox is not just a trend based on economic (attention economy), political (the digitalization of state and public services), and cultural (the culture of self-optimization) contexts at a macro level, but is 'a deeply personal thing told in a thousand micro-stories' (ibid.: 9). Hence it is important to explore different reasons why people take a detox and variations in how they choose to talk about it in their lives.

### **Human and non-human agency**

As users have to obey game rules once they use the app, they are often seen less powerful than the app designers and digital technology that structure the rules. However, users are not passive but active agents. De Certeau (1984) uses the concepts of 'strategy' and 'tactic' to explain different practices of the powerful and the non-powerful respectively. Strategies are only available to subjects of 'will and power' (ibid.: xix). A strategy can define a 'proper' place as 'the basis for generating relations with an exterior distinct from it, while tactics only 'insinuates itself into the other's place fragmentarily' (ibid.). Strategies can produce political, economic, and scientific rationality, offering a schematic ordering of social reality. However, people's everyday practices can be tactical, resisting and disrupting the ordering constructed by the strategic model. As Lupton (2018: 107) argues, technologies are appropriated and domesticated as part of regular or everyday routine, but human actors are able to use digital technologies in diverse and sometimes contradictory ways. Therefore, the meaning and usage of digital applications are not fixed but rather open to change and contestation according to specific contexts and different actors (ibid.).

According to Actor-Network Theory (ANT), technological objects should be given equal status to humans. The actor-network approach describes the enactment of materially and

discursively heterogeneous relations that produce and reshuffle all types of actors including human beings and technologies (Law 2007: 1). If there is a thing as ‘the social’, it is made up of networks that consist of heterogeneous assemblages (Inglis and Thorpe 2019: 250). Actants in networks are human and non-human (ibid.). According to Latour, actants point to anything has the potential to ‘modify a state of affairs by making a difference’ (2005: 71). Agency in this sense is understood as an effect. Humans, animals, technologies, and other non-humans all have agency - the ability to ‘act’ (Bueger and Stockbruegger 2016: 8). Every medium or technology has characteristics, constituting their own ‘affordances’ (Gibson 1967) that enable specific actions and set the limit of people’s usage (Couldry and Hepp 2017: 89).

Technologies participate as material actants in relationships with human actors to configure human-technology assemblages (Lupton 2014). We should consider the dynamic nature of people’s interactions with technologies in a world in which digital technologies are integrated into our social relations and help construct the meanings of subjectivity and embodiment (ibid.; Latour 2005). For instance, wearable devices render self-tracking and self-quantification easier to achieve than before, while the generated data has altered the ways in which we come to know the self and body (Lupton 2016).

Digital technologies as participants in the user-technology assemblage shape our practice and understanding of sleep, health, self-care, embodiment and selfhood. Mobile apps, as a form of digital technologies, have the power to construct and configure the capabilities and desires that are attached to them, but can also resist and disrupt them. The networks, made of discursive and material things and relations between them, are fragile and open to change (Inglis and Thorpe 2019: 250). In terms of app use, both human and non-human technical actants modify and disrupt the configurations. On the one hand, human makers and users have agency to decide how to design and use the app. On the other hand, technological affordances delimit the scope within which apps can be created, developed, and used (Lupton 2014).

I will situate my empirical study on gamification of sleep in the deep mediatized, digitalized, and commodified context. In the analysis, I will mainly draw from gamification theories, Foucauldian perspectives, media engagement theory, and ANT, and apply the concepts of gamification, governmentality, surveillance, agency, and engagement in my interpretation of the empirical findings. Ideas inspired by ANT will also be elaborated in the methodological approach.

## Qualitative research on *SleepTown*

This chapter will outline the methodology and method for the case study on the gamification of sleep via mobile apps on smartphones. Social constructionism forms the foundation of the research. Thematic coding works as the method to analyze the empirical data collected through in-depth interviews with users.

### Methodological approach

This thesis is built upon a social constructionist approach. Social constructionism argues that our common ways of understanding the world are not from the nature of the world, but is constructed between people, both past and present, through their daily interactions (Burr 2015). In particular, people's knowledge about and practice of 'doing' sleep are socially constructed within the context of ongoing processes of medicalization, depoliticization, commercialization, mediatization and digitalization (Williams 2005; Lupton 2018). Gamification has also contributed to the meaning-making process of sleeping. Digital media technologies play an important role in constructing the social world. Analyzing both the mediated construction and the material presence of the media (Couldry and Hepp 2017: 88) are essential, if we strive to understand how and why people's perception and practice of sleep are shifted in the digital age.

Inspired by ANT, I will pay attention to both human actors and non-human actants in the network (Latour 2005). Non-human objects have agency as humans (ibid.). In the case of *SleepTown*, users, softwares, smartphones, and technologies, are important factors that can develop or disrupt the associations. Consequently, when analyzing how *SleepTown* affects people's understanding and practice of sleep, not only the content carried by the app but the materiality of digital devices and technologies will be taken into consideration. However, since the main focus of this thesis is user engagement, analysis of human agency will take up more space than that of non-human agency.

Case study research is useful to produce contextual knowledge (Flyvbjerg 2001). Instead of staying on an abstract theoretical level, case studies help researchers to develop a more

nuanced view of reality (ibid.: 72). The concrete experiences also help researchers improve professional learning skills and generate fresh ideas ‘via continued proximity to the studied reality and via feedback from those under study’ (ibid.). Moreover, concrete and context-dependent knowledge generated from one single case also contribute to scientific development and theoretically generalized knowledge. The power of the good example should not be underestimated. Since researchers cannot completely avoid subjectivity when choosing a case, it is not a problem to pick a case based on one’s own experiences and intuition, as long as the generated claims ‘obtain in dialogue with other validity claims in the discourse’ (ibid.: 81), contributing to the scientific discipline and public sphere. I regard *SleepTown* as a good example for studying the gamification of sleep. It allows us to better understand sleep in a deep mediatized context, think about the interconnection between sleep, game, and productivity in a neoliberal framing, and the role digital media play in these relationships.

According to Flyvbjerg, more activated actors and basic mechanisms in the studied situation can be revealed by extreme cases (ibid.: 78). To some degree, *SleepTown* can be an extreme case with rich and unusual content regarding sleep and gamification. There are two reasons why *SleepTown* is a suitable case for studying the gamification of sleep in China. First, *SleepTown* amplifies and makes the best of gamification to influence users’ sleep behaviors. This app doesn’t treat game techniques as a small or less important part of app design as other health apps, but spares no effort in forming its unique gameful characteristic. In *SleepTown*, sleep-wake cycle setting and game mechanism are deeply interwoven with one another. The boundary between health apps and digital games is blurred, because the strong game design pushes *SleepTown* further into a serious town-building game (Xu 2017). Second, the excellent performance of *SleepTown* makes the case ‘especially good in a more closely defined sense’ (Flyvbjerg 2001: 79). *SleepTown* attracts users around the world and was awarded *Best Personal Growth Apps* of 2019 in 15 regions<sup>6</sup>. In particular, it is often ranked among Top 3 Health & Fitness app in Apple App Store of China<sup>7</sup>. The app is graded 4.8 out of 5 based on over 19,000 ratings<sup>8</sup>.

To conclude, I will combine a social constructionist approach with case study, to get a closer

---

<sup>6</sup> The 15 regions are Canada, Australia, UK, Mexico, Brazil, Russia, Germany, France, Spain, Italy, Turkey, India, Thailand, Indonesia and North Africa. See Google Play: <https://play.google.com/store/apps/details?id=seekrtech.sleep&hl=en>

<sup>7</sup> See information about ranking: <https://www.applyzer.com/?mmenu=rankings&app=1210251567&market=1>

<sup>8</sup> See Apple App Store (China): <https://apps.apple.com/cn/app/SleepTown-睡眠小镇/id1210251567>



look at the phenomenon of gamification of sleep via smartphones. Inspired by ANT, both the content aspect and the material aspect of digital media are taken into consideration when exploring the interaction between users and technologies.

### **Doing qualitative interview**

Qualitative in-depth interview is a useful research method for accessing individuals' attitudes and values (Byrne 2018: 220), which meets the need of this research, that is, to understand relationships between gamification techniques, users, and digital technologies. To maximize the utility of information, I aimed to interview 10 Chinese users, aging from 16<sup>9</sup> to 30, sleeping alone, who have used *SleepTown* for more than 3 weeks (more than 4 times a week). People in their teens or twenties especially students are main targets of the app, constituting the majority of potential interviewees. Basic information about the interviewees, the duration and frequency of usage was collected in advance. I chose users who sleep alone in order to exclude the variation of intimate relations and better investigate the app function. To generate richer data, I strategically included people who still use the app and those who have stopped using it. Their engagement and disengagement will offer us different perspectives to look into the function of game mechanism and its influence on people's daily life.

I didn't intend to keep a balance of gender but tried to recruit male and female users. On the one hand, following a social constructionist perspective on sex and gender, I would like to group patterns of behavior rather than to presume two dichotomies in each category (Lorber 1993: 571). I aim to look for identifying markers of the people who enact similar behaviors (ibid.). On the other hand, I admit that people's aims and experiences of using *SleepTown* may be different due to gender norms and stereotypes. I heard some 'gendered' opinions when preparing for the recruitment. Hence I decided to include female and male users but didn't intend to balance the number. As the gender difference is interesting but not the main concern of the research, I will reflect on it briefly in the footnotes in the analysis.

---

<sup>9</sup> The author didn't find any specific ethics of interviewing minors (under 18 years old) in China. According to *The Act concerning the Ethical Review of Research Involving Humans* (2003) in Sweden, children between 15 and 18, who have adequate information about the research project to undertake activities freely and with awareness of possible adverse consequences, can consent without parent's authorization.

I combined the snowball approach with the volunteer sampling through online recruitment. Snowball sampling via friends' recommendations helped me identify the salient characteristics of users within a network (Seale 2018: 167). The volunteer approach based on online adverts helped me find different users who were interested in this topic and may have particularly unusual or interesting insights to deliver (ibid.). As a result, I recruited 13 interviewees<sup>10</sup> consisting of 2 males and 11 females, 1 female for piloting and the rest for data collection. The interviews were conducted in Chinese, through online video or audio calls on *Wechat*(微信)<sup>11</sup> on the laptop. On account of ethics of qualitative research (Brennen 2012), a brief introduction of the research and consent form<sup>12</sup> were given to interviewees before start. The consent form promised the interviewees that their identity would be anonymized<sup>13</sup>, and also asked for their permission for recording the interview.

The semi-structured qualitative interviews allow interviewees to speak 'in their own voices and with their own language' (Byrne 2018: 221). Questions were designed as open-ended and flexible questions so as to get more considered views. Questions followed six themes: Context, App, Sleep, Gamification, Detox and productivity, and Engagement. During the interview, people were allowed to say as much as or as little as they wanted. Luckily, they all showed a big interest in participating. The qualitative interviews were of high quality, offering rich data for analysis and various paths to findings. In the end of each interview, interviewees were allowed to make supplements to their arguments and ask questions, to enrich the empirical material and inspire me to improve the following interviews.

Due to the coronavirus pandemic in China, most people especially students were stuck at home. Therefore all the interviewees talked to me online at home. Before the interview, I suggested them to choose a relaxing and quiet place so as to make themselves comfortable without interruption. As Beijing Time is 7 hours ahead of Stockholm Time, all the interviews were conducted between 5pm to 8pm in China (10am to 1pm in Sweden) to make both of us awake and focused. The piloting was conducted through a video call on March 10<sup>th</sup>. The interview guide<sup>14</sup> was improved a bit after piloting, restructuring some overlapping questions.

---

<sup>10</sup> See the list of interviewees in Appendix 1

<sup>11</sup> *WeChat* is a Chinese multi-purpose messaging and social media app with over 1 billion users (Wikipedia).

<sup>12</sup> See the consent form in Appendix 2

<sup>13</sup> The initial of interviewee's *WeChat* nickname (e.g. Interviewee D) will be used when referring to the original data.

<sup>14</sup> See the interview guide in Appendix 3

The first interview started on March 11<sup>th</sup> and the last interview was finished on March 15<sup>th</sup>. The 12 interviews ranged from 50 minutes to one hour and a half, recorded by phones and manually transcribed<sup>15</sup>. I first slowed down and listened to the recordings carefully to transcribe. After this, I listened to the recording again in the normal speed to double-check. The material resulted in 168 pages of transcripts in Chinese in total.

## **Analyzing the data**

Thematic coding is a useful way of analyzing data, as it reduces the volume of original data and turns it into patterns that are easier to ascribe meaning to (Rivas 2018). The research analysis went through three basic stages, from open coding, to category development, and theme formation (ibid.). A mixture of inductive and deductive approaches was adopted in coding process. Open coding and categorizing inductively allowed me to be immersed in the empirical data and generate my understanding in detail, while the deductive approach was helpful to conceptualize my data interpretation to more general theoretical ideas. I also read some literature about sleep, gamification, and surveillance before coding, in order to get a sense of ‘theoretical sensitivity’ (ibid.: 431).

Through thematic coding, descriptive codes, sub categories, categories and themes<sup>16</sup> were produced. As all the completed transcripts were saved in separate Word documents, I read the text thoroughly and started open coding, highlighting some quotes and making sidenotes. To get initial codes down and trace the original text conveniently, all the codes were converted into an Excel sheet and marked with 12 different colors representing 12 interviewees. Next, the spider diagram<sup>17</sup> was drawn to organize thoughts (ibid.: 374-375), group related codes thus making it more convenient to suggest sub categories. Codes in different colors indicating the same (sub)category were put into the same big block. Finally, a deductive approach was applied when it came to categories and themes. Concepts inspired by the literature were critically applied to five final themes, that are, Game mechanism, Technological affordances, Sleep routine, Daily practices, User engagement.

---

<sup>15</sup> See an example of transcript in Appendix 4

<sup>16</sup> See an example of coding process in Appendix 5

<sup>17</sup> See examples of spider map in Appendix 6

The openness of interpretations allowed me to be more experimental when analyzing, exploring, and finding suitable paths in the coding process. For example, I spent time dealing with overlapping codes regarding users' feelings. Users express their feelings when interacting with the game mechanism or using the app for different purposes. Some feelings (e.g. a sense of control) were mentioned frequently in their media engagement, while some (e.g. guilty) were only triggered by specific events. I was uncertain about whether to treat 'affects' as a separate category, or combine feelings with triggers. After I found it was difficult to isolate emotions from causes, I decided to build categories based on causes and made feelings incorporated. In this sense, the overlapping codes within different themes reminded me to explore the connections between fragments of data and consider the data in the larger context of text (Bazeley 2013: 144). I returned to the original data and codes multiple times, so as to find the most salient points and sort them into appropriate preliminary categories. I also made mind maps<sup>18</sup> to see the interrelations between rough categories and themes. To make a dialogue between findings and theoretical concepts, I went back and forth between the app, the empirical material, and literature.

## Critical reflections

First, I want to reflect on the process of recruitment. At first I used snowball sampling to gather potential interviewees, by asking people around me if they had any recommendations for interviewees. However, there were not a large number of *SleepTown* users around me and my friends. I only got 4 people and they could not recommend me others because they knew few users around them. They either did not use the function of *Circle* or had stopped using it for a few months. Hence, I decided to use volunteer sampling - making online posts on Chinese social media *Weibo*(*微博*)<sup>19</sup> to recruit more people. I posted an advertisement<sup>20</sup> in the *Super Topic*(*超级话题*)<sup>21</sup> page of *SleepTown*.

---

<sup>18</sup> See examples of mind maps in Appendix 7

<sup>19</sup> *Weibo* (*Sina Weibo*) is a Chinese microblogging website, similar to *Twitter*. Weibo is one of the biggest social media platforms in China, with over 445 million monthly active users (Wikipedia).

<sup>20</sup> See the screenshot of advertisement in Appendix 8

<sup>21</sup> *Super Topics* are interest-based content community pages created and edited by *Weibo* users. Online sub-groups are thus created and developed, separated from the main *Weibo* space. These *Weibo Super Groups* are similar to the 'mega-threads' or

There were risks and benefits of online recruitment. On the one hand, the people I contacted through online posts belong to the ‘active’ group that engages with *SleepTown* and social media. They allowed strangers to see their using experiences and daily life regardless of their different aims<sup>22</sup>. ‘Invisible’ users who did not leave their digital footprint were excluded from my samples (Seale 2018: 167). On the other hand, I successfully found 9 interviewees with interesting insights (ibid.). Having more active users allowed me to generate richer data from their app use and online practice. Their close relationships with digital media inspired me to explore the connection between their experiences in the physical world and their actions in the virtual world (within the app and on social media). Their online behaviors affect the meaning-making process of sleep, blurring the boundary between the private and public sphere.

Second, I want to reflect on the non-face-to-face ways of interviewing. Due to the geographical distance between China and Sweden and the special circumstances of coronavirus, I chose to conduct interviews through video call. However, many Chinese netizens, who get used to being anonymous or using pseudonyms online, preferred not showing their faces to strangers and hesitated to participate in video interviews. 4 people I recruited online were interviewed through audio calls as they were uncomfortable with the video format. In this sense, the quality of Internet connection matters, and the non-verbal cues and body language are difficult to monitor through the long-distance encounter (Byrne 2018).

I felt worried about the quality of interview and trust building through audio conversations. Hence, I always checked Internet connection and prepared warm-up questions in advance. During the interview, I stayed focused and sometimes repeated or concluded interviewees’ answers in short, to make sure there were no missing points or misunderstandings. This could be one of the reasons why interviews lasted over one hour on average. In the end of interview, I asked all the interviewees including those who were interviewed through video calls to send me screenshots of what they had mentioned or any relevant materials they would like to share

---

‘subreddits’ on *Reddit*. On the main page of every *Super Topic* page, the main subject or purpose of the super topic is briefly explained, and the number of views, followers, and posts are displayed. A super topic-page can be created by any *Weibo* user and can be managed by hosts. The main host(s) can decide which content will be featured as essential, placing sticky notes and posting links to suggested topics. (See more information on: <https://www.whatsonweibo.com/what-are-weibos-super-topics/>)

<sup>22</sup> Some users want to record their lives and share their using experiences with others in the *Super Topic* page of *SleepTown*. Some people just look through the page, comment on or like others’ posts, when they want to join in a *Circle* for instance.

with me. These supplements vividly illustrated what they meant in the interview and helped me better understand their sleep and online practice. In particular, I felt less unsure after the first audio interview had gone smoothly. Interviewee *L* was interested in my topic and cooperative when answering questions and sharing the screenshots with me. Though I didn't see her face, her encouraging feedback gave me confidence to conduct following audio interviews.

Last, I want to reflect on my position in the research. I started to use *SleepTown* last year when I was preparing for the preliminary proposal. I used it twice a week on average, for a research purpose. To be familiar with app features and better understand experiences of potential interviewees, I have started to use the app more than four times a week since February 2020. Though I didn't use the approach of autoethnography, the one and half month's immersion allowed me to deeply explore the app and get practical tips about clocking in, building constructions, unlocking achievements, exploiting the 'backdoor', etc. I also went through some online materials about *SleepTown* including official webpages and users' comments, to get a broader picture. Not only the literature and online information but my own app use helped me structure the interview guide, and offered visuals<sup>23</sup> in the analysis. I felt more connected to the interviewees and confident when conducting interviews.

Though I focused on the interviewees' practices rather than my experience, it was impossible to avoid bias completely. The designed questions and the interpretation of empirical data were inevitably colored by my previous and current social and cultural experiences (Bazeley 2013). However, this unavoidable filter was not a big problem as long as I recognized the fact that both my activities and myself are embedded in the social world I study. In fact, researchers' agency plays an essential part in qualitative analysis, because 'information' in transcripts cannot be transformed into 'data' without the researcher's eyes and question (Altheide and Schneider 2013: 6). Although I could not escape from my experiences, I should be aware of the subjectivity of interpretation by being reflective of the overall process (ibid.: 13). Despite the fact that there is no 'one, true meaning' of the scripts (Hall 1997: 9), I strived to think critically and justify my understanding in detail through concrete examples, to better settle the views and make the interpretation convincing.

---

<sup>23</sup> In this thesis, figures without referring to interviewees were from the official website or the author's app.

## **Constructing a *SleepTown* in everyday(night) life**

The management of sleep in everyday/everynight life, related to health directly or indirectly, is a complex affair with different roles, actions, strategies and options, personalized and socially tailored (Williams 2005: 159). The chapter of analysis is divided into three parts: *Gamification and sleep regulation*, *SleepTown in everynight/day life*, and *Conformity, negotiation, and resistance*. In the first section, I will focus on the game mechanism of *SleepTown* and how it is designed to regulate people's sleep. The gameful features and settings in the app will be introduced in detail. Users' feelings about specific game elements will be analyzed to shed light on the functionality of the app, and in a broader sense, on gamification as a form of governmentality. As users' experiences are not only about the game and sleep routine but involving daily activities, in the second section, I will discuss how users' sleep routine and daily practices are affected by their engagement with a multifunctional mobile app. Their active collaboration and negotiation, resistance to the app, and specific tactics developed to satisfy their own needs will be explored in the last section. How users trust, value, and evaluate the app and their ambivalence about app use will also be elaborated.

### **Gamification and sleep regulation**

In this section, I will explore how the game mechanism of *SleepTown* works, to attract users and regulate their sleep. Theories about gamification, engagement, and Foucauldian ideas on governmentality and surveillance will be used to analyze different features and settings in *SleepTown*, as well as people's thoughts and feelings. Inspired by ANT, I will also discuss how the sleep regulation is enabled and limited by the agency of digital technology.

#### **Feedback mechanism**

Giving continuous and prompt feedback is one of the fundamental principles of gamification design (Matallaoui et al. 2017). Different users have different opinions about the feedback mechanism of *SleepTown*. The engagement with the feedback mechanism involves affective and cognitive work (Corner 2011: 91-93). Positive and negative emotions, and critical

appreciation regarding the functionality and aesthetics (Hill 2017: 8) are mixed up when people engage with the feedback mechanism. Some users value the positive feedback techniques and confirm the effectiveness of rewards for constant sleep regulation. Others pay more attention to the negative feedback including the damage to buildings, and strive to avoid negative emotions triggered by punishment.

In Apple App Store, *SleepTown* is categorized as a Health & Fitness app that creates a fun and simple way to help users develop healthy sleep habits. By achieving bedtime and wake-up goals every day, users construct and collect amazing buildings (Figure 1, 2). Besides various buildings, users also gain other types of rewards such as coins, tickets and badges which can be used to expand and decorate *The Big Town* (Figure 3), redeem rare buildings, and fulfill their *Achievements*.



Figure 1 A normal building

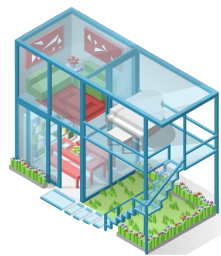


Figure 2 A rare building

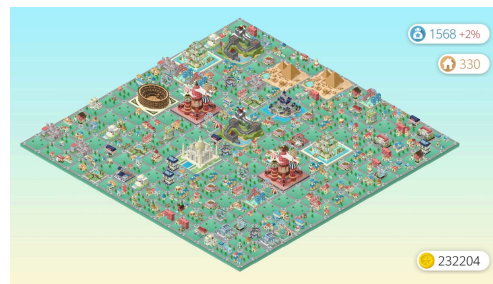


Figure 3 *The Big Town* (Interviewee Y)

### ***Buildings and badges***

People get bored or tired of doing sleep in the ascetic way. *SleepTown* helps users feel more rewarded for making their best effort. The building is not only a reward for regular sleep but also a surprise that motivates users to wake up every morning. In most cases, the building is randomly allocated<sup>24</sup>, which means users can receive a well-designed virtual gift when opening their eyes every morning. As Interviewee *K* demonstrated, ‘*SleepTown makes sleeping a chance to surprise yourself. [...] The building is a reward or a proof of your regulated sleep last night*’. People are satisfied when they get an outcome as a positive feedback that confirms their efforts.

---

<sup>24</sup> Users usually don't know what the next building will be, unless they spend coins specifying a building that he/she has already constructed previously. (The allocation of building may not be purely random as there could be algorithms analyzing users' information and deciding what the next reward should be).



Thanks to the gamification strategy, sleep is transformed into a fun and entertaining experience. The conduct of sleep is guided by pleasure and desire rather than coercion (Deleuze 1992). People desire buildings for all kinds of reasons<sup>25</sup>. Some users enjoy the sudden rush of pleasure when an unexpected building shows up. Some users regard collecting as a powerful drive. They may not feel motivated by the idea of sleep regulation, but are eager to collect all types of rewards and complete the mission. For some users, a visually attractive building is compelling for purely aesthetic reasons.

*The buildings are **designed well**. You can **zoom in** and see constructions with **rich detail** (Figure 4). (Interviewee I)*

*I liked the cinema, the villa with a pool, and the building like a four-sided courtyard (Figure 5). They depict my **dream architecture**. (Interviewee Q)*



Figure 4 Zooming in on the building



Figure 5 The dream architecture (Interviewee Q)

How the game looks is an incredibly vital aspect of aesthetics, directly affecting a player's experience (Schell 2008). There are users who are initially attracted by specific visual design of buildings in the Town. Users' positive engagement confirms the visual value and attractiveness of well-designed buildings. Although some users recognize that they are treated by virtual symbols programmed by computer code, their happiness is real and is not ruined by this fact. As Interviewee *W* said, '*the buildings are just data*', but she '*was happy to construct*

---

<sup>25</sup> Users' desire for buildings can be constructed based on gender norms. Tiny and well-designed buildings are seen more attractive to girls instead of boys. Some female interviewees regard *SleepTown* as a girl-targeted app and thought boys '*do not care about cute buildings*' (Interviewee *P*) or '*sleep and apps*' (Interviewee *M*) as girls do. They tend to '*only recommend SleepTown to girls*' (Interviewee *P*) or '*discuss the app use with female users*' (Interviewee *M*).

a building and post screenshots of it on Moments(朋友圈)<sup>26</sup> of WeChat'. Even though the sense of happiness only last a few seconds or minutes and disappears quickly, the buildings do bring users a sense of pleasure and satisfaction, motivating them to continue constructing buildings thus following the sleep schedule consistently.

All types of constructed buildings are displayed in *Buildex* (Figure 6) - the display of collection. It not only shows how many kinds of buildings the user has collected, but also motivates the user to continue sleeping regularly to unlock the unknown buildings. Before collecting all the buildings, users are greatly driven by curiosity and ambition, holding expectations for the next surprise when falling asleep. When users gather all types of constructions, their sense of satisfaction and achievement reach the highest level. The completely unlocked collection fills users with pride. Users can share their happiness with intimate friends and families, and possibly strangers online. As Interviewee Y showed, 'I was so excited when unlocking all the buildings, and posted the screenshots of them on Weibo'.

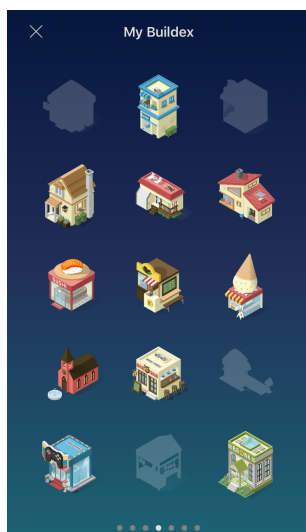


Figure 6 The interface of *Buildex*



Figure 7 The interface of *Achievements*

Badges, as a representation of *Achievements* (Figure 7), is another kind of reward. Badges motivate, track, and visualize users' progress (So and Seo 2018: 396). They are special rewards for specific acts. In general, some achievements can be unlocked by making individual efforts to regulate sleep, while others are randomly given depending on the

<sup>26</sup> *Moments* is a social-networking function of *Wechat*. It is known as 'Friends' Circle' in Chinese. It allows *Wechat* users share and get access to the accepted *WeChat* friend's information (pictures, short videos, music, links, etc.), creating a private communicating circle.

building you have constructed. For example, you can get a ‘7 in a row’ when reaching the goal 7 days in a row. Yet, badges like ‘*School Day*’ or ‘*Enjoy your meal*’ will only be unlocked if the user randomly constructs a school or a restaurant.

Badges are more scarce rewards than buildings, as the system offers fewer badges and badges only show up under limited circumstances. Both time and fortune are needed to unlock *Achievements*. To some degree, the badge becomes a loyalty reward that symbolizes users’ efforts (Zichermann and Cunningham 2011). Compared to new and inactive users, regular and active users who interact with the app frequently will have more chances to be rewarded.

### ***Towns and Mayors***

*The Big Town*, a space for users to appreciate and manage the rewards, is a mixture of regulation and freedom. Users’ conduct of sleep is discursively shaped by the neoliberal mode of governmentality (Foucault et al. 1991): Even though people are limited by the pre-defined rules and buildings they get, *The Big Town* leaves them space for exercising freedom and autonomy. Users can design the Town freely as long as the system allows them.

*The random surprise given by the system and your own subjective choices coexist. Although you are not allowed to choose which building to get, you can arrange them freely in your Town.*  
(Interviewee K)

Play is about freedom but the purpose of gamification is control (Rey 2014). *SleepTown* offers people a chance to get sleep done and enjoy the process of sleeping. Gamification works as a form of soft power that produces willing subjects (Foucault 1975) and self-motivated consumers (Rey 2014). Users feel more engaged and are willing to be more self-responsible. In *The Big Town*, the user is the only master called *Mayor*. *Mayors* are able to ‘drag’ their houses to their town and arrange them, spend coins buying blocks or decorations or removing destroyed buildings, apply special themes on holidays, etc. The title of mayor brings users pleasure and a sense of responsibility. To some extent, taking care of one’s Town becomes a part of self-responsibility-building project, as people are continuously urged and educated to bridle their phone addiction and govern themselves.

Although there is no citizen in the Town, responsible mayors feel they should design the Town as ‘appropriate’ as in real life. The Town is often divided into different functional districts: ‘*commercial zones*’, ‘*industrial zones*’ (Figure 8), ‘*residential neighborhood*’, etc.

Creative users also give special names to the areas dominated by the same types of buildings.

*'College Town'* is the district full of schools. *'Disneyland'* points to the area full of fairgrounds. Districts dominated by banks or cinemas are called *'Financial Center'* or *'Universal Studios'*. (Interviewee W)



Figure 8 The industrial zone (Interviewee W)



Figure 9 Districts divided by color (Interviewee Q)

*The Big Town* satisfies users' needs for self-expression, showing that they are unique and distinguishable from other users. Though buildings in the Town are 'fake', people connect virtual buildings with landscapes in real life. Some users also pay attention to building color. They put together buildings in the same color and categorize areas into red, yellow and blue districts (Figure 9). The visually organized arrangements can give them *'a sense of order and fulfillment'* (Interviewee Q).

### ***Failure and punishment***

Negative feedback techniques in the gamified setting are different from those in the social context. Compared to punishment for crimes in the physical space, punishment in a virtual game gives users less pressure but more encouragement. Users are inspired to get more rewards, beat competitors and avoid punishment. In *SleepTown*, the punishment for individual users mainly points to the destroyed building (Figure 10) and following negative emotions.



Figure 10 The destroyed building

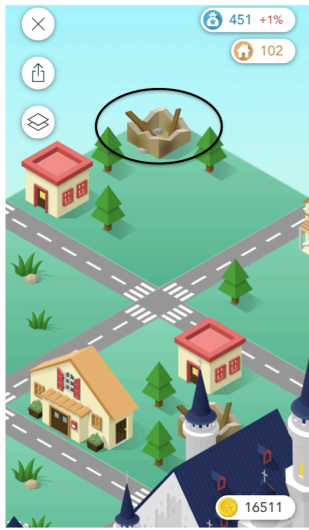


Figure 11 The destroyed building in *The Big Town*



Figure 12 The destroyed building in weekly data

According to the game rule, if users leave *SleepTown* during the sleeping time or do not wake up on time, their buildings under construction will be destroyed. The destroyed building embodies and visualizes the sleeper's 'failure' (Figure 11, 12). Users are not only bothered by the ruined house, but also disturbed by the sense of guilt. After waking up, they often blame themselves and regret what they have done last night. However, self-reflection in the daytime doesn't guarantee the self-regulation at night. It is possible that one's Town lies in ruins if the user has failed for several times. Users may lose confidence and interest, and disengage with the app in the end. To avoid undesired results and keep the app useful, most users stay alert to the failure and negative emotions.

*I think they [the destroyed buildings] are very **ugly**. [...] I was not rich in the beginning. [...] It was **not pleasant** to spend 100 coins removing a ruined house, so I always remind myself to not destroy the building. (Interviewee F)*

Though failures exist in the gameful environment, risks or punishment are not very severe. Negative feedback, as a subtle form of disciplinary power, mainly highlights behaviors that should be improved or changed. The destroyed buildings can be removed if you use coins. The negative emotions such as disappointment also disappear quickly, as 'it's not worthwhile to ruin your day because of an app' (Interviewee L).

Although the destroyed building doesn't matter a lot, users who fail to disconnect with their

phone or wake up too late, do reflect on themselves and remind themselves to follow the sleep schedule next time. Users can clearly decipher what they need to do so as to make progress and avoid failure (Whitson 2014: 347). It is the self-reflection and possible improvement that matter. Therefore, negative feedback mechanism embodies a political style of governmentality - libertarian paternalism (Thaler and Sunstein 2008). On the one hand, users feel free to make their own decisions. On the other hand, the failure is designed as an awful option bothering users. Users' own judgment will guide them to make a 'wise' decision and be better off in such conditions. People's behavior is thus regulated in an intended way. In this sense, the role of self-tracking media is extended beyond the mere record of sleep matters to complete cases of 'manipulation in the name of entertainment' (Williams 2005: 156).

In *SleepTown*, gamification is adopted as a technology of government, a type of disciplinary power (Foucault 1975). It shapes users' conduct in the hope of producing certain desired effects and averting certain undesired events (Whitson 2014: 341). People are encouraged to voluntarily participate in self-optimization and care of the self. The performance metrics and feedback are majorly positive and focused on rewards, progress, achievement, and engagement instead of underlining deficiencies. Though people are motivated by a sense of guilt and regret caused by failure, in most occasions they learn from bad experiences. Self-reflection is prioritized as a route to self-improvement (ibid.: 344). Users can reach a sense of mastery when making an improvement and processing towards goals.

### **Mutual surveillance**

Before the *Circle* was released, awards and punishment were designed to target individual users, to help them with self-surveillance. Nonetheless, after the *Circle* was introduced, more and more friends or families as well as strangers are connected in 'sleep groups', following the same sleep schedule and building a fancy *Wonder* together. When people are watched by others, their sleep patterns and game status become visible and comparable. Members exposed to others' gaze are disciplined to conform to the socially accepted behaviors (Foucault 1975). Mutual surveillance becomes an effective way to help users regulate sleep.

The *Circle* targets and satisfies people's desire for rewards, altruism and competition. There are new positive and negative feedback generated by the *Circle*. For positive feedback,

building a *Wonder* with others is the most salient characteristic of a *Circle*. The well-designed *Wonder* visualizes the common goal shared by members. Many people are attracted by this unique feature and spontaneously monitor their sleep. For negative feedback, different from individuals punished by the system, participants in the *Circle* are punished by real people. Members who do not obey group rules or social norms may be hurt by the others' complaints. Some 'lazy' members may be kicked out by the *host*.

The *Wonder* (Figure 13) is the most visually attractive reward in a *Circle*. Different from personal buildings, group *Wonders* are '*bigger and more impressive*' (Interviewee X). To construct a *Wonder*, the user has to join a *Circle* and make a contribution. Members in the same *Circle* are able to check other members' contribution and weekly performance. The interface of a *Circle* (Figure 14) consists of a visual of the *Wonder* and the leaderboard.

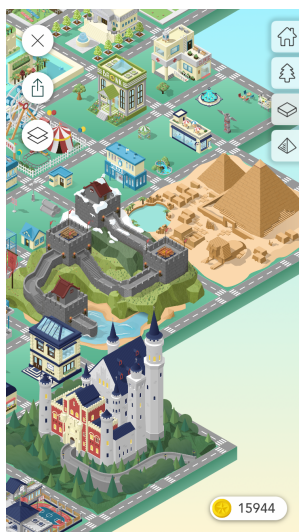


Figure 13 *Wonders* in *The Big Town*



Figure 14 The interface of *Circle* (Interviewee Y)

The *Circle* aims to help members achieve regular sleep, by exposing them to peer pressure and a sense of responsibility. It is necessary to defend the impression fostered by themselves during their presence in front of friends. Users can be motivated to employ defensive or protective tactics such as performing to influence others' perceptions of their image.

*You need to consider your **image** in front of friends. I will strive to **keep it up**. [...] You actually have to **perform** when using the app. If my friends in the *Circle* see me contribute to the *Wonder* everyday, they will see me as a **self-disciplined** person. (Interviewee F)*

People's identity is constructed through their behaviors as well as others' eyes. From a Foucauldian perspective, the *Circle* combines two models of surveillance - 'panopticon' (Foucault 1975) and 'synopticon' (Mathiesen 1997) in the viewer society. Each person in the *Circle* is able to check others' status and contribution, while at the same time everyone is surveilled by others. Every user disciplines, and is disciplined by, others. The disciplinary power is naturalized by the game rule, and is internalized by group members. Users submit to monitoring and voluntarily optimize themselves. Since maintaining a regular sleep schedule is normalized as the socially accepted behavior and the so-called 'healthy sleep habit', people who break the rule and do not keep a regular sleep are 'unhealthy' and 'irresponsible'. As most people have the desire to fit in and do not want to become others' 'burden', they are motivated to make a contribution to the group outcome. In some occasions, sleep is no longer an individual necessity, but a kind of teamwork based on cooperation.

*We exclusively **focused on Circle** and didn't care about personal buildings or Town. [...] Most of us work in Shanghai. Our **ambition** was to 'construct Lujiazui(陆家嘴)'. We named it Lujiazui as it is the well-known glitzy commercial district in Shanghai. (Interviewee R)*

When people pay attention to *Circle* and *Wonder*, they not only check the status but also give meanings to the goal and outcome. For example, Interviewee R formed a *Circle* with her close friends. The metaphor of *Lujiazui* denotes the big goal the group wanted to achieve and their ambition to conquer sleep problems. They placed a high value on the group outcome and gave it a realistic meaning. Borrowing the name of a well-known landscape in the physical world to label a virtual group indicates the close interconnection between the virtual and physical world. The mutual goal reflects their strong wishes to build a career in a highly competitive environment. For them, building a *Wonder* is not just about regulating sleep, but embodies a group project highlighting unity and productivity.

As everyone in the *Circle* is the governed and the governor, members especially the host of a *Circle* is empowered to monitor and discipline others' behavior. According to the official principle, hosts have the authority to kick out members who have not contributed to the *Wonder* for over 3 days. Although rules can be flexible depending on different communities and hosts, members are more or less pressured by a sense of responsibility and obligation. In practice, some hosts strictly follow the 3-day rule. Some loosely execute the rule, 'purifying' the *Circle* periodically (e.g. every 10 days). Others may ignore the rule and do not care about the speed of construction. When the host or members ignore social expectations for their



behaviors, confusion, embarrassment and conflict may occur. Non-host members feel powerless and angry about the host's irresponsibility.

*I **quitted** the Circle because I felt **exhausted** when the host didn't care about the constructing process or member management. [...] Some members like me slept regularly everyday while others just **exploited** our contribution and shared our outcome. [...] I prefer a strict host. The rule is like a **mutual consent**. I **dislike** people who violate rules in both virtual and physical world. (Interviewee K)*

The *Circle* helps users build trust and establish hierarchies. However, the forged alignments are unstable and can be disrupted if members ignore or violate the rules. As the pressure that members feel varies in degree, the surveillance mechanism may not work for particular groups or users. For instance, the disciplinary power of surveillance can be reduced when involving close friends. As Interviewee *R* said, she felt relaxed to reveal the authentic inner self to close friends: *'If someone does not contribute to the Wonder, others will not make any complaint.'* She *'cannot form a Circle with acquaintances or strangers'* as she will be *'sorry and embarrassed about the little contribution'*. In front of intimate friends, *R* wants to be the true self and even be irresponsible sometimes, as she knows her friends will be tolerant and allow her to break the rules. For users like *R*, getting along with close friends means taking off the mask and reveal uninhabited selves. *Circle* in this case may not function as it intends. Yet, for users who are disciplined by friends' gaze, conforming to the ideal of self-discipline plays a vital part in their social interactions. Hence *Circle* can be a stage where authenticity and performance encounter and play off. Members' daily contribution to the *Wonder* can be a self-conscious performance of the authentic self, or an intentionally produced action.

### **Technological affordances**

The meaning and the materiality of technology are equally important when understanding how technologies are integrated into everyday life (Silverstone et al. 1992). Our daily life is constructed from and through technologically mediated processes and infrastructures of communication (Couldry and Hepp 2017: 535). When exploring how people's sleep is regulated through *SleepTown*, not only the 'content dimension' but also the 'object dimension' of the app should be discussed (Silverstone 2006).

Certain forms and material aspects of media use can be naturalized over time (Couldry and Hepp 2017: 88). For example, apps, different from other forms of media, benefit from the mobility and the ease of access and use (Lupton 2014). Due to the simple format and location on mobile devices, apps are easily downloaded and carried collecting, updating and sharing health information (ibid.). In fact, the prevalence of *SleepTown* is based on the increasing smartphone use. The pervasiveness of mobile technology makes smartphones habitual in our daily life, and people take it for granted. People often put phones close to them before sleep, so they can easily reach them whenever they want. Other digital media like laptops or tablets cannot really replace smartphones. Due to its special characteristics (tiny, mobile, smart), smartphones are allowed to build an intimate relationship with users, thus becoming a good carrier for sleep-tracking services.

Every medium has an affordance (Gibson 1967), offering the possibility for specific actions as part of its usability (Couldry and Hepp 2017: 89). In the case of *SleepTown*, the affordances of smartphones, including the operating systems and installed applications, delimit users' app use. In general, Android system and IOS system are designed by different corporates and have different interfaces and equipped applications. Although *SleepTown* is available to both Android and IOS users, there are differences existing in the app settings. For instance, the setting of *Strict Mode* is only available to IOS users. When turning off the *Strict Mode*, leaving the app during sleep won't affect building constructions. Therefore iPhone users are allowed to make a choice when regulating sleep. They can choose to 'turn off the *Strict Mode*, playing on the phone and building a house at the same time' (Interviewee L). The power of regulation becomes weaker since the game mechanism rather than monitoring mechanism weighs more heavily. The developers of *SleepTown* did this change due to IOS system limitations. This change echoes some consumers' advice, as they wish to have a pause button 'for emergency' if they have to leave the app and answer a phone call for instance.

To adapt to the upgraded IOS system, *SleepTown* is improved with more 'humane features that give users more freedom and less regulation' (Interviewee K). Nevertheless, Android users are not offered such an alternative. Their mode is always strict, which means their buildings will be destroyed when they leave the app. Compared to Android users, IOS players can exploit the *Strict Mode* and build houses more easily. For IOS players who only want to collect buildings instead of regulating sleep, turning off the *Strict Mode* is the most convenient way. Android players have to seek other tactics to construct buildings without

following the game rule. The tactics will be explained and analyzed in next chapter.

The affordances of technology not only produce possibilities but set the limits of specific actions. The human-non-human assemblages consist of different actants are fragile and open to change (Lupton 2016). Failures and adjustments are inevitable in such networks (ibid.). For example, the storage of smartphone is one important factor when people consider installing a new app. People may refuse to download *SleepTown* if they are ‘low on storage’ (Interviewee X). The battery drain problems also occur when constructing the building. The building may collapse ‘if the phone didn’t connect to a Wi-Fi network’ (Interviewee X). Sometimes bugs just appear without any reasons. As the server is not in Mainland China, technical bugs happened on some Mainlanders’ phones such as ‘the disorder of *The Big Town*’ (Interviewee P) may not be fixed quickly. Users who are not allowed to check buildings, design and decorate their Towns may lose passion and interest in the app. Hence, the app, smartphones, operating systems, and the server, have the agency to modify a state of affairs (Latour 2005). Their agency is achieved in association with human actors and other actants. When actants don’t play the role that designers or users assign to them, the constructed networks can be easily dismantled (Bueger and Stockbruegger 2016).

To summarize, technologies enable and develop human practices, and constrain and condition them at the same time. The usage of *SleepTown* and sleep regulation is a collaboration between producers, users, smartphones, and the app. Non-human material objects have agency, and they may not be easily controlled or domesticated. The app and smartphones have the capacity to disrupt and resist human practices.

### ***SleepTown* in everynight(day) life**

The division between the sleeping and waking world is a continuum rather than a dichotomy (Williams 2005: 171). Sleep-related matters and issues in waking life further problematize any neat divide (ibid.). Through regular use, a mobile app can steadily lose its strangeness and become a routine piece of equipment embedded in everyday life (Silverstone and Haddon 1996). In this section, I will discuss how *SleepTown* influences users’ sleep routine and daily

practices in life. Theoretical ideas about media engagement in everyday life, self-optimization, digital detox, and productivity will be used to explore how *SleepTown*, as a multipurpose tool, functions in both the sleeping and waking world.

### **Sleep routine**

Once people start using *SleepTown*, their sleep routine are influenced by the app functions. People's sleep can be divided into three periods: before bed, during sleeping, and after waking up. Their sleep time, pre- and post-sleep routine, rituals or habits constitute parts of the active 'doing' and 'undoing' of sleep (Williams 2005: 77). By using *SleepTown*, people make self-conscious efforts to achieve better sleep during different sleep periods. According to the empirical finding, *SleepTown* mainly regulates users' sleep time rather than sleep quality, and affects their pre-sleep rituals.

### ***Sleep time***

In terms of bedtime, wakeup time, and duration, users can focus on different aspects when using *SleepTown* out of various reasons<sup>27</sup>. Some users aim to go to bed and get up early, so as to 'feel vitalized' and 'have more time to arrange daily schedules' (Interviewee X). Some only want to avoid staying up and to fall asleep earlier, so getting up early or on time is not that important for them. As Interviewee R said, the app only affects her bedtime, as she has to 'get up early anyway and commute from home to the workplace'. Yet, some 'night owls' do not have a pursuit of early bedtime nor early wakeup time. For example, Interviewee F didn't mind staying up, and set her 'bedtime at 1am and wake-up time at 9am'. The only thing she wanted to achieve is to 'fix the schedule', so she wouldn't feel like 'living in different time zones every day'.

---

<sup>27</sup> Users' motivations for regulating sleep time can be 'gendered'. During the interviews, a few female users rather than males underlined the biological function of sleep and its effects on body and appearance. Girls felt threatened by 'pimples and poor skin quality' (Interviewee K, Y, F), 'hair loss' (Interviewee P), 'sore eyes' (Interviewee Y), and 'heart discomfort' (Interviewee K, F), and thus were motivated to avoid staying up and have a regular sleep, to 'stay healthy, young and pretty' (Interviewee M). Only one male expressed his concern about 'memory loss' due to 'short deep sleep' (Interviewee X). Compared to males, females can be more obsessive with the consumption of 'beauty sleep', and are more disciplined and disadvantaged in a patriarchy society (Williams 2005). It is worthwhile to explore how users' engagement with sleep-regulating apps reveals the gendered politics of sleep in further studies.

Although *SleepTown* helps users regulate their ‘biological clock’ regarding sleep, it doesn’t say a word about sleep quality. This echoes the common deficiency of productivity apps - avoiding discussing the content and limit of work being done (Gregg 2018: 79). In fact, once you start to use *SleepTown*, the default is that your sleep problem can be cured by a mobile app. In other words, *SleepTown* only works for people whose sleep is disturbed by phone addiction or other minor problems that can be easily solved by personal effort. Serious sleep disorder or insomnia caused by broader context or conditions that cannot be changed by individuals, are ignored. For example, several interviewees stated that their biggest sleep problem is ‘*being habituated to staying up*’. They do not suffer from dyssomnia, such as having difficulty falling asleep or frequently waking up from bad dreams, in a ‘medical’ sense. Most interviewees are just obsessed with scrolling through social media, watching videos, or chatting with friends at night.

Compared to sleep disorder caused by overwork, unemployment and poverty, staying up caused by digital addiction seems to be dealt with more easily. A healthier sleep habit can be built once people determine to detox. The only thing *SleepTown* - a productivity app can do is to assist people who decide to get rid of phone addiction and keep a regular sleep schedule. It makes no guarantee or contribution to better sleep ‘quality’. It doesn’t get to the root of sleep problems or phone addiction, either. In this sense, *SleepTown* doesn't solve or care about factors leading to phone addiction, but only reminds people of the importance of a regular sleep and helps them ensure bedtime, wakeup time, and sleep duration in the final stage.

### ***Pre-sleep rituals***

*SleepTown* has a direct impact on people’s sleeping time, and also affects their pre-sleep rituals. Pre-sleep rituals are dimensions of body-techniques and habits, helping people get into the preparatory phases of sleep (Williams 2005: 77). The natural stimulus of fatigue is always associated with darkness, quietness, and a particular mode of preparation (Schwartz 1970: 491). *SleepTown* in this case is not just a monitor for regular sleep but also a reminder for sleep preparation. For example, *SleepTown* reminds users to put down their smartphones, and urges them to do particular activities to prepare for sleep.

*After clicking the ‘sleep’ button, I keep some time before bed [...] for **reading books** or **practicing meditation**. [...] Clicking the sleep button performs a **ritual**. It turns on my **sleeping mode**, and I start to prepare my mind for sleeping. (Interviewee M)*

*I start to **stop working and disconnecting** with the outside world, **brushing my teeth on the balcony, reading books or watching films**. It's my own time. It belongs to me only. I feel strong **happiness** during this pre-sleep period. [...] 11pm is the boundary I make. I will tell myself that 'it's time to **calm down and be relaxed**. [...] No need to worry about the outside. Just focus on your own body and be completely at ease'. (Interviewee P)*

Users' bedtime may not be accurately regulated by *SleepTown*. Rather, the app gives them a hint and gentle push: it helps users go to bed early and sleep more regularly, by limiting their phone use at night. Making the phone fall asleep earlier and starting to construct a building remind users to disconnect with phones and start growing tired or sleepy. Hence individuals do not simply prepare for bed when they are tired, but they grow tired because they prepare for bed. People do physical activities or mindfulness practices intentionally, to avoid digital media distraction and get physical and/or mental preparation for sleep. Sleep is thus mediated by body techniques that bring it under people's partial control (Williams 2005: 77; Crossley 2004). The pre-sleep rituals in a set precise manner are seen as effective techniques that help people establish a sense of order and security.

People's sleeping rights can be strategically legitimized and protected by *SleepTown*. *SleepTown* offers users an opportunity to focus on themselves, purifying their sleeping environment and their own minds. As Interviewee P demonstrated, constructing the building 'offers a good excuse for not replying others' messages at night'. It allows the user to create a clear boundary between work and sleep, between the public and private. This excuse empowers her to be 'more assertive and less guilty' when ignoring others' messages. The virtual outcome of *SleepTown* is thus strategically used to resist the sleep disruption and deprivation in real life. From the media perspective, *SleepTown* is also a useful tool for people to limit smartphone addiction, achieving 'phone detox' or a 'phone break'.

*The app **limits** the 'obligatory communication'. I can **avoid** external stimuli, regardless of messages or news or posts. [...] I also need to **disengage** with unconscious habitual entertaining activities like scrolling through Weibo. (Interviewee P)*

People are reminded to explore the joy of missing out instead of drowning in the fear of missing out or endless entertainment (Syvertsen 2020). Digital overload is problematized as obligation or addiction. Some users felt they were fighting drug addiction when using *SleepTown*. The abstention from digital media use for a defined period is always praised as achieving the healthy sleep hygiene (Dement and Vaughan 2000). Although gamification techniques brighten up the dullness of detox and amplify the excitement of achieving good

sleep hygiene, *SleepTown* shares the ascetic dimension of productivity apps - blocking distractions and the unimportant neediness of others (Gregg 2018: 98).

*SleepTown* is strategically used as a tool to avoid multi-tasking, ignore external pressure, and nurture the authentic self. It helps users specify the boundary between work, study and rest, between external communication and internal reflection. Users have a chance to self-reflect, get more self-knowledge, and enrich their lives before sleep. They have more time to focus on personal issues, listen to inner voices in their minds, and gain a sense of control and satisfaction (ibid.: 10). For these users, *SleepTown* is less a sleep-regulation app, but more a productivity app that helps them effectively manage schedules, workloads, and activities during the pre-sleep period (Gregg 2018).

### Daily practices

Users' engagement with *SleepTown* affects not only people's sleeping practice but also their daily activities. The app can be gradually incorporated within daily customs and rhythms of individuals. According to the empirical finding, people's entertainment, social network, and consumption are influenced by their app use.

#### *Entertainment*

Playing on *SleepTown* can be integrated to people's daily entertainment. For example, people use bites of time for bites of joy. They make use of breaks in the daytime, to design and decorate their Towns, check the constructing process of the *Wonder* and *Circle* members' status, share new buildings with friends and compete with each other, etc. In particular, users who are interested in planning Town spend more time imagining and inventing the design.

*People have their own thoughts for city planning. [...] Now my town (Figure 15) is an industrial town based on a big factory. I plan to promote city transformation by collecting more entertainment facilities such as fairgrounds and cinemas. [...] I am serious. I have to make a plan for city blocks (Figure 16). (Interviewee D)*



Figure 15 The industrial Town (Interviewee D)

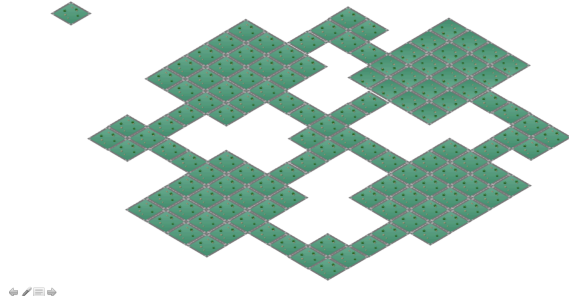


Figure 16 The town plan (Interviewee D)

Game helps people imagine and invent the future (McGonigal 2011: 302). Different users have different blueprints for their Towns. *SleepTown* not only gamifies sleep but also boost users' creativity and imagination. It helps players rethink and reinvent the way we design cities, and allows them to actualize their dream towns. Moreover, active users can develop new ideas or patterns to make sense of the app service. For instance, they may want to add more 'lively' elements to the Town and send feedbacks to producers.

*As time went by, I recognized that the Town looks **strange** in some aspects. You had a few buildings and facilities in the Town, but there was **no people, car, or weather**. It was so strange. Some users expressed similar ideas online. Hence I **collected** our thoughts and sent an **email** to the **producers**. They replied me two days later and said it's a good idea and they would sent it to the **technical department** for their references. (Interview X)*

Interviewee X devoted himself collecting buildings and planning personal Town, but also showed dissatisfaction to existing Town setting and made critical suggestions. To make his advice more convincing, he communicated with other users online and listened to their ideas. The communication between users and producers indicates that users play a vital role in the human-non-human assemblage of technology innovation. Users' gaming experiences and feedback can shape the next generation of technological products. Users are not only adapters but co-producers and social sharpeners of technology (Syvertsen 2020).

In addition to in-app gaming, *SleepTown* users are inspired to create relevant entertaining activities through online platforms. There is a close relationship between *SleepTown* and digital media platforms such as social media and video-sharing websites. For example, some users record their city-planning process, edit the video and post it on social media or video websites. Some are also inspired to use their creativity, building connections between *SleepTown* and other games.



*I recorded the screen when using SleepTown, cut some parts and edited it. I don't think my time is wasted. Rather, it is a **pastime** for me. (Interviewee M)*

*I constructed three SleepTown-style buildings (Figure 17,18) in **Minecraft**<sup>28</sup>. The constructing processes were recorded and posted on **Bilibili**(哔哩哔哩)<sup>29</sup>. (Interviewee Q)*



Figure 17 The original building in *SleepTown*  
(Interviewee Q)



Figure 18 The user-made *SleepTown*-style building in *Minecraft* (Interviewee Q)

The user-constructed linkage between apps, games, and media platforms, gives users freedom to use their imagination and creativity to fully engage in what they like. As Interviewee Q has ‘*an interest in architecture*’, the 3D game world of *Minecraft* allows him to ‘*actually construct the building step by step*’. His constructions are inspired by buildings in *SleepTown*, but also represent his own creative thoughts for buildings. Although he is not allowed to change the building design in *SleepTown*, he is empowered to reinvent the building outlook and enhance the interior design in *Minecraft*.

In some occasions, users’ needs for entertainment and social networking are mixed. For instance, Interviewee M enjoys making lifestyle Vlogs and uploading them to the video website - *Bilibili*. She started to record her usage of *SleepTown* and share them with others, as she ‘*wanted to find someone to form a Circle*’. She ‘*successfully recruited 6 members through Bilibili*’. Hence, sharing *SleepTown*-related videos online is not just a means of self-entertainment, but also a way to expand the sleep *Circle* and the social circle. Stronger social connectivity can be developed through users’ active engagement with *SleepTown*.

---

<sup>28</sup> *Minecraft* is a sandbox video game which allows players to explore a blocky, procedurally-generated 3D world. Players can discover and extract raw materials, craft tools, build structures or earthworks (Wikipedia).

<sup>29</sup> *Bilibili* is a Chinese video sharing website themed around animation, comic and game (ACG) (Wikipedia). Users can upload and watch fan-made videos, and add barrage subtitles (弹幕) on the videos.

### ***Social network***

*SleepTown* can help different groups of people, no matter if friends or strangers, connect with each other. As McGonigal (2011: 82) argues, reality is disconnected, while the game mechanism builds stronger social bonds and lead to more active social networks. As *SleepTown* is not equipped with instant messaging technology, people cannot directly talk to each other in the *Circle*. The creation and expansion of *Circle* depend on external communication channels such as online platforms and face-to-face talk. Users can post adverts on social media platforms to recruit members, or build a *Circle* with friends around them in real life. Therefore, *SleepTown* indirectly contributes to users' social network.

*It's interesting to build a Wonder together. For example, you can **meet** different people in the Super Topic of SleepTown on Weibo. Sometimes we **follow** each other on Weibo. To some degree, you can **expand** your social circle. (Interviewee L)*

Users are able to know more people and possibly make friends with strangers, or strengthen existing close relationships, or both. For strangers, *Circle* gives them a chance to expand social network. For close people, *Circle* offers them a platform to unite and to have fun. For example, Interviewee *R* was invited by her close friends to join in the *Circle*. The *Circle* was built upon and developed from offline friendships. *Circle* and *Wonder* become one of the topics for their daily communication. People's daily opportunities to actively connect with people they care about can be ensured in this way (McGonigal 2011). Not only *Circle* but also *SleepTown* create new topics for friends. People can use *SleepTown* and relevant communication channels to keep in touch. As Interviewee *D* showed, her friends and she 'created a group chat', 'sharing screenshots of newly collected buildings' but also 'trash talking'. In this sense, users not only build a 'sleep group' in *SleepTown*, but also start a group chat outside the app sharing their using experiences and daily life with one another. The app extends the in-app connectivity into other digital communication and into the offline life.

*SleepTown* also allows strangers to create communities and share private sleep information with one another. For example, *Super Topic* of *SleepTown* on *Weibo* gives strangers a chance to break the ice. A community arises when a group of people who have a common interest start to interact with each other in order to further the interest (McGonigal 2011: 172). Positive participation such as sharing relevant information or interesting experiences is required (ibid.). People do not feel burdened but enjoy the sense of solidarity, belonging and

fitting in. Users can freely post screenshots of their triumphant moments as well as recruitment advertisements on the page. The governmentality boosted by gamification is productive, enabling people to ‘act upon action’ (Rose 1999: 4). Different forms of intimacy and communities are created and developed in and out of *SleepTown*, shaping people’s sleep routine and daily practices. In addition, people’s online networking can contribute to their daily entertainment. When hosts recruit members via social media, they are easily distracted by news, images, and videos on the platform for relaxation.

### **Consumption**

Inspired by *SleepTown*, users can become more obsessed with the fantasy of ‘great sleep’ and the consumption of health (Valtonen and Moisander 2012). Users, as consumers of commercial products, can be encouraged to spend more money and time on sleep/health-related products or services. For instance, some users think the disciplinary power of *SleepTown* is not strong enough, so they consume other sleep-tracking products or services to monitor and optimize their sleep patterns more comprehensively.

*I also bought a **watch** to track sleep. [...] It shows your **deep and light sleep**. [...] I was so worried about my short deep sleep and thus paid more attention to sleep. (Interviewee X)*

*My new **bracelet** records my sleep quality more **accurately**. I usually check the data every Sunday and write sleep diary comparing weekly data. (Interviewee M)*

As demonstrated before, *SleepTown* doesn’t pay attention to users’ sleep quality. The tracking function is simple, only recording two time points and sleep duration. This disadvantage can be overcome if users are equipped with more ‘technical’ devices or products. For instance, wearable self-tracking devices collect more data and analyze sleep patterns from various perspectives. The scientific metrics and graphs of data generated by technical devices also have a powerful visual impact. People’s inputs, performances, and outputs can be readily measured and quantified (Lupton 2016). Self-trackers can thus gain more self-knowledge, through technological ‘exosenses’ that extend the body’s sensory capabilities (ibid.: 146). Despite the fact that many users do not know the inner mechanism of smart devices, they believe and make sense of the collected personal data, and ideas and norms about quantification, thus contributing to the reflexive self-monitoring practices.

Besides self-tracking devices, users also consume other supplements or alternatives to

improve their sleep. People can partially control their sleep by employing various body techniques (Williams 2005). Some users listen to ‘*slow-tempo relaxing music*’ (Interviewee *F*) or use ‘*earplugs*’ (Interviewee *X*) to create the right conditions for healthy and restful sleep, so as to fall asleep quickly. Some purchase ‘*steam eye masks*’ (Interviewee *I*) and ‘*fragrances*’ (Interviewee *M*) to relax their senses, bodies and minds. In addition to techniques related to human sensory systems, supplements like ‘*Melatonin*’ (Interviewee *D*) are also helpful for people who suffer from insomnia to regulate sleep-wake cycle.

People’s ideas about sleep, health, and a well-slept life are also shaped by consumer culture and the marketing discourse. In a consumer society, sleep and health are commodified in the market while every person is a ‘ready-made consumer’ (Williams 2005: 160). Every personal gain from *SleepTown* justifies users’ consumption, and motivates them to consuming sleep and health continuously. It is pleasure and desire that govern people’s consumption of health (Deleuze 1992). Once users enjoy the sense of control and satisfaction by using *SleepTown*, they can be induced to purchase more products in the name of ‘great sleep’, health and well-being. The normalization of ‘sleep-as-consumption’ pushes people to integrate themselves into the consumer society (Valtonen and Moisander 2012). Though ‘great sleep’ is an illusion created by enterprises and consumerism, consumers can actively purchase tracking products aiming for not only ‘sleep hygiene’ but also an enjoyable and socially responsible experience.

### **Conformity, negotiation, and resistance**

In previous sections, I have explored gamification techniques and the role *SleepTown* plays in the sleeping and waking world. Based on previous examples and analysis, in this section, I will discuss users’ conformity and resistance to the app, and how they perceive and negotiate their relationships with digital media technologies in everyday life.

In general, people are attracted by the functionality of *SleepTown* or use it for fun. In particular, users position themselves in different places in the spectrum of engagement. Their engagement with the app can vary in forms and in intensity, long lasting or intermittent. Users who aim to build healthy sleep habits tend to execute the game rule made by *SleepTown*,

totally or partially following the sleep instructions. Some people use *SleepTown* as a productivity app to manage pre-sleep schedules, indirectly regulating sleep. Players who only value the entertaining part of *SleepTown*, develop different tactics to avoid sleep regulation. They end up with treating *SleepTown* as a complete game, or disengage with the app.

### Regulating sleep

To improve health and increase social perks, people submit to monitoring willingly (Whitson 2014), which means conforming to the game rules set by *SleepTown*. Many users appreciate that *SleepTown* gamifies mundane sleep and turns sleep into a fun experience. However, many users clarify that gameful elements are just ‘added values’ to the core function of sleep regulation. ‘*Constructing buildings is secondary to the need to keep a regular sleep schedule*’ (Interviewee R). Obviously, in terms of an app called *SleepTown*, ‘sleep’ comes first.

Some users strictly follow the sleeping rule and become loyal followers of the game mechanism. *SleepTown* gives them clear and basic instructions on how and when to sleep: click the ‘sleep’ button, go to bed on time, fall asleep, wake up on time, click the ‘wake up’ button and get up. Not only their bedtime, sleep duration, and wake-up time but also the pre- and post-sleep rituals are effectively regulated and somewhat fixed by the app.

*I set the bedtime goal as 11:20pm and wakeup goal as 6:30am. I usually wash up around 8:30pm and then watch some news. At 9:30pm, I click the ‘sleep’ button<sup>30</sup> in SleepTown, put down the phone, and sack out. I set an alarm on my phone for 6:26am. I will wake up a few minutes before the wakeup goal and then click the ‘wake up’ button. [...] The healthy sleep helps me stay awake and energetic in the daytime. I won’t feel sleepy when reading or running in the morning. (Interviewee X)*

The sleep-regulating function of *SleepTown* reflects the ways to achieve self-care. *SleepTown* gives people a clear instruction about how to build a healthy sleep habit, and people regularly ‘subject themselves to a thorough examination of their conscience and keep themselves under constant control’ (Whitson 2014: 344). Users can get a sense of control over the ‘messiness and unpredictability of their fleshly body’ (Lupton 2016: 158). Furthermore, the game

---

<sup>30</sup> In *SleepTown*, users are allowed to click the ‘sleep’ button or ‘wake up’ button 2 hours before the bedtime goal or wakeup goal, which means they can make use of the flexible time to prepare for sleeping or get ready for the daily routine.

mechanism amplifies people's pleasure and constructs an illusion of freedom. Users are less revolted by the pervasive manipulation or even do not see it as a problem. They perceive themselves as powerful *Mayors of The Big Town*, who are active agents with autonomy. They voluntarily conform to the neoliberal logic of governmentality and discipline themselves to be ideal healthy citizens. In other words, conforming to the game rule designed by *SleepTown* is the precondition for app use. The conformity not only helps people decrease lifestyle risk factors but also shows people's passion for social acceptance and honor.

### **Managing functions**

Although the game rule is fixed by app designers, users are allowed to decide how to use the app to regulate sleep and what to use the app for. Some users only use part of the functions of *SleepTown* to regulate their sleep, and ignore the others. Some use the app in a way that is not intended, to adapt to their own needs. Sleep regulation can thus be actualized in different ways.

Users have autonomy to decide what functions of the app to use or not. As illustrated before, some users prefer to form a *Circle* with others rather than sleep 'alone'. They prefer to be disciplined by others' gaze, as they feel more motivated for self-regulation when threatened by the sense of guilt and shame in a community. Some also want to maintain or expand social network through a *Circle*. In contrast, some feel burdened to cooperate with others and prefer to building houses alone. As Interviewee *P* explained, '*it is bothering when getting along with others, no matter sleep or study. You somewhat have to wait for your company.*' For people who are confident in themselves, self-surveillance is more 'convenient' and 'efficient' than mutual surveillance.

Rather than following the game rule strictly, some users make their own use of *SleepTown* to monitor sleep and develop extended functions of it. For example, people are supposed to click the 'sleep' button when they are on the bed and ready to fall asleep. Yet, the button can be used as an alarm of 'sleep preparation' in practice, warning users that 'it's time to say goodbye to your phone'.

*I don't follow the app to go to bed. However, if my phone doesn't rest, I am not sure when I will*

*fall asleep. [...] To some extent, the start of building-construction **reminds me to sleep**. It reminds me to **stop interacting** with the outside world. I don't have to reply any message. (Interviewee P)*

Users can optimize their sleep in various ways and make their own choices of how to use the app. They can keep a regular sleep pattern without strictly following the determined bedtime and wake-up goals. According to users' experiences of sleep regulation, we can tell that, for some users, building healthy sleep habits mean rigidly execute the instructions given by *SleepTown*, following the sleep patterns designed by the app. However, for others, healthy sleep is achieved through critically engaging with the app and adapting its functions to one's own life. As Interviewee *F* clarified, '*SleepTown is simply one means of regulation. How it functions depends on one's agency*'.

Users always negotiate their relationships with *SleepTown* in everyday(night) life. In order to create or develop suitable sleep routine, useful elements of the app are taken into account while non-useful or distracting functions can be ignored. Nevertheless, the definition and practical application of useful game elements depend on individuals' needs and affordances of technology. Although the app rule is fixed to some degree, users can play the game flexibly to suit their own needs.

### **Playing a game**

App designers are somewhat powerful rule makers who build the app framework and design game rules. The strategies they have produced define a specific space in which users' sleep can be monitored and regulated (De Certeau 1984: xix). The rules represent the will and power of producers (ibid.). However, users can create tactics to negotiate with, or even resist and disrupt the ordering constructed by strategies. For example, users who fail to regulate their sleep through *SleepTown*, may question and resist the disciplinary power. They ignore the sleep-regulating function of the app and reduce the app into a pure collecting game<sup>31</sup> or a town-building game.

---

<sup>31</sup> 'Collecting games' here refer to games that encourage players to collect characters, cards, weapons, animals, buildings, etc. For example, gacha game is one type of collecting games. By 'pulling' or 'spinning' the gacha, the player will get a randomized character, card, etc. Some rewards have a lower chance to appear, the player has to spin the gacha several times to get the desired outcome (Wikipedia).

*After **failing** to reach the goal for several times, I **gave it up**. [...] I don't think the app works for me because I just want to **collect buildings**. (Interviewee L)*

*SleepTown* only offers an available tool for users to manage sleep. It advises people to build healthy sleep habit and assists users to achieve regular sleep, but it doesn't make any guarantee of successful self-optimization. Users can still cheat on their bedtime, sleep duration, and wakeup time. As Lupton (2016: 55) points out, people can 'hack' their device and use it in ways that were not planned or expected by the designers. When some users recognize their sleep cannot be managed through *SleepTown*, they may choose to opt out of the sleep regulation simply playing the game, or stop using the app. As Interviewee R indicated, *'it's meaningless to continue when my sleep cannot be regulated by the app'*.

Players can develop various tactics to cheat on the game mechanism, circumvent sleep regulation and collect buildings. First, it is common for sleepers to 'slack off', by putting down the smartphone and playing on other digital media such as laptops, iPads, or another phone. As Interviewee F mentioned, she could *'let the phone construct a building and meanwhile binge-watch TV shows, browse the forum and make posts via the laptop'*. The sleep displacement is thus created by the common media use in the bedroom and in bed (Exelmans and Van den Bulck 2017). Gaps between the bedtime (lying down), shuteye time, and sleep are constructed and widened.

Second, the setting of *Strict Mode* provides IOS users with an official 'back door' that allows players to collect buildings<sup>32</sup> without following the sleep schedule in real life. Neither people's phone use nor sleep routine is disciplined. Third, although Android users are not 'officially' granted to opt out, they find other ways to 'loaf'. For example, the tactic of *'closing SleepTown running in the background'* is shared by Interviewee Y and I. As Y demonstrated, after closing it, she could use other entertaining apps like *NetEase Cloud Music*(*网易云音乐*)<sup>33</sup> and *Weibo*: *'You could do whatever you want while the building was still under construction'*. However, since Y *'upgraded the Android system, there has been no bug anymore.'* Different from Y, Interviewee I can still exploit the bug now if she *'doesn't*

---

<sup>32</sup> They can click the 'sleep' button, leave the app and use other apps on the phone, and click 'wake up' button on time, in order to get a building and contribute to the group *Wonder*.

<sup>33</sup> *NetEase Cloud Music* is a freemium music streaming service owned by a Chinese tech corporate - NetEase, Inc.



*feel sleepy around bedtime*'. Hence though people use the same operating system, the existence and function of bugs depend on versions of systems of different devices. The affordance of Android system limits users' choices regarding *Strict Mode*, but enables their tactical opt-out.

In terms of feelings of circumventing sleep regulation, users often feel guilty at the beginning, and then get used to it and feel 'nothing'. As Interviewee *L* said, '*as time went by, I recognized that there was no need to embarrass myself*'. They do not try to explain or find excuses for themselves when they recognize that exploiting bugs is 'deceiving themselves'. Rather, users who bypass the game rule clearly know their behavior is not 'correct'. Some users do correct their behavior, as Interviewee *Y* reflected on the self-made trick and reminded herself '*to follow the rule next time*'. However, some users who get used to cheating themselves especially IOS users like *L* who '*always turning off the Strict Mode*' may not go back to the sleep regulation. For them, *SleepTown* is reduced to a collecting game for fun, or a networking app through which they fulfill their obligations to *Circle* members.

Users' resistance to the disciplinary power is visibly performed through opt-out. There is also invisible resistance to gamification techniques in people's minds. Some users question the result of gamified sleep regulation. For example, users who are greatly driven by the goal of building constructions, gradually realize that sleep is made secondary to the game. As Interviewee *Q* reflected, '*building a virtual house becomes the pursuit, while sleeping is simply a path to play*'. People are doing sleep in the same way every day, but their focus has shifted from health to entertainment. Extremely speaking, sleeping becomes a part of daily entertainment and attractive experiences. This could be a deficiency of *SleepTown* and a flaw of the application of gamification in a commercial discourse (Schrape 2014). Only behaviors are targeted and thus monitored and optimized. People's attitudes towards regular sleep and health do not matter as long as their behaviors stay 'correct'.

### **Taking or losing control**

Users may share similar feelings regarding self-optimization, but hold different opinions about the way to achieve it - through a mobile app or digital media technology. All the interviewees mentioned the difficulty to regulate sleep without external assistance. Some

point out the weakness of inner willpower, while others underline the inevitability of external stimuli. It is common for people who decide to use *SleepTown* to talk about achieving a sense of control over the body or life. When people conform to the ideal of the optimized person, they can get reassurance, and what Lupton describes as, ‘an enhanced sense of self-knowledge and self-management’ (2016: 171).

Nevertheless, some users feel ambivalent about self-optimization via digital media technology. They accept and problematize their dependence on technology. As Interviewee *F* clarified, ‘*I become more dependent on the app and smartphones. Although I accepted to be regulated by SleepTown, I hope I won’t rely on it too much and get rid of it finally*’. People can regard self-monitoring as a sign of weakness or inability (Lupton 2016). They value human willpower and aim to achieve self-control without technological interventions. In contrast, some users do not regard technological assistance as a problem. A few users take the pervasiveness of technology as granted, and do not recognize the potential paradox of ‘using media to control media use’. Others do not see it as a contradiction as their ‘*actual screen time is reduced*’ (Interviewee *P*). For them, the benefits of digital media technology outweigh the risks.

*Integrating technology into our life is a **social process**. It’s **good** to see technology helps us **reach goals** that we cannot achieve by ourselves. (Interviewee *P*)*

*The smartphone is a **multifunctional** tool. You can use it for communication or **self-control**. What matters is **how to use it**. [...] The app is **effective** as long as you can regulate sleep and do not addict to your phone. (Interviewee *R*)*

Users can admire the integration of digital media technology and human dependence on technology. They don’t blindly praise the benefits of digital media technology, but believe in human agency in handling challenges and making new sense of technology. As smartphones are increasingly personalized media, individual usage patterns rather than media become more of an issue (Syvertsen 2020: 73). Users trust their own capabilities to use the app in a proper way, thus living compatibly with digital technology. In this sense, users are not losing control but still taking control of their daily practice. They can choose to use the app to effectively regulate sleep or opt out whenever they want.

Digital use can be both liberating and damaging. To some degree, *SleepTown* becomes a touchstone of ones’ ability of self-control: the app doesn’t help users master self-discipline, but examines their determination to succeed. Only those who firmly believe in the app’s

functionality and integrate it into their own routine can regulate their behavior effectively and be more self-disciplined. They give away partial control to the app in order to gain control over their behavior (Svensson 2019). Other users may struggle to find a lasting balance: they cannot completely prevent phone addiction at night on the one hand, but are attracted by the game mechanism and don't want to abandon the app on the other hand. Users who finally stop struggling will become either 'self-discipliners' or 'players', or 'non-users'.

Besides the human-technology relationship, users also express their concerns about the security and privacy of sleep information. All the interviewees mentioned their passivity when discussing data collection. There is a 'privacy policy' in the app, but few interviewees noticed it or read through it. Accepting the terms and conditions of the app seems to be naturalized as a precondition for app use that people rarely question. As Interviewee *D* explained, '*whether you are informed or not, there is no secret in the digital age*'. Some users feel less worried about it because they don't think the data collected by *SleepTown* is 'valuable' when their sleep is '*not correctly or accurately recorded*' (Interviewee *M*). They cannot stop the 'collection' but can decide the content of 'data'. Most interviewees expressed individual powerlessness, and admitted that they had lost control over how their digitized personal information is collected and used by companies. What they could do is to adapt to it and modify their attitudes towards it under different circumstances. As Interviewee *F* said, '*I am fine with my data to be used to improve the app. I am not happy to know my information sold to others but I will endure it as long as I am not severely hurt*<sup>34</sup>'. Hence users get used to convincing themselves to be less sensitive but more silent and tolerant about the 'unavoidable' data collection and exploitation. Users' dependence on technology can give more authority to tech companies to gather personal data and make profits from it.

---

<sup>34</sup> People tend to '*tolerate or ignore the telemarketing calls*' (Interviewee *F, R*), but they will fight against the data exploitation when '*personal interest is extremely harmed (e.g. identity theft)*' (Interviewee *R*).

## Conclusion

Mobile apps have become an important element of contemporary digital technology use, making an impact on people's everyday(night) life such as sleep. Sleep-monitoring apps have significant implications for sleeping practice and the user-technology relationship. They have the potential to shape the ways we understand sleep and digital media technology. The app design can attempt to 'pre-domesticate' technologies to conform to norms of sleep hygiene and values promoted by healthism. However, how media technologies are integrated into everyday routine depends on the association of users and technology. There are new ways of experiencing sleep in a deep mediatized context. Both technical objects and human users have agency to make a difference in the process of gamification of sleep. The sleep-regulating function of the app is enabled and limited by affordances of digital media technology, while users can engage with a multifunctional app in various forms and in different intensity.

When sleep regulation encounter gamification strategy, an implementation of governmentality is developed. Individuals' capability to act is not crushed but utilized to produce desired outcomes (Whitson 2014). In the thesis, I have used *SleepTown* as the entrance to ask questions about the interaction between gamification strategy and sleep regulation. Following the statement that *SleepTown* affects people's sleep routine and daily practices, I have asked how users engage with *SleepTown* and understand their sleeping/gaming experiences, exploring the meaning shift of sleep caused by an app and user engagement.

### Regulating sleep in a gameful environment

*SleepTown* adopts gamification as a strategy to effectively regulate users' sleep. There are two game mechanisms in the app - feedback mechanism and surveillance mechanism. Feedback mechanism includes positive and negative feedback techniques (Schrape 2014). Positive feedback techniques consist of rewards including visually attractive buildings, tickets, badges, and a user-designed Town. A well-designed building or badge not only rewards users for their self-disciplined behavior but also motivates them to continue monitoring themselves to get more rewards. *The Big Town* satisfies their needs for freely expressing self-uniqueness (Matallaoui et al. 2017): Even though users cannot change the appearance of buildings, they

are entitled as *Mayors* who can move and remove buildings, plan and decorate their own dream Towns. Negative feedback techniques mainly point to the destroyed buildings, as the visualized failure. People feel unhappy and disappointed about the bad-looking visuals as well as their failure. Compared to violating the game rule, following the rule, constructing fancy buildings, and building healthy sleep habits are constructed as more desired options.

In *SleepTown*, the surveillance mechanism connects individuals' self-surveillance with mutual surveillance within a group. The *Circle* encourages users to form a 'sleep group' in which members are allowed to check each other's status and contribution to the group outcome - *Wonder*. People who participate in the mutual surveillance discipline others as well as themselves. They enjoy the sense of solidarity when working together for a mutual goal, but are threatened by a sense of guilt and shame if they fail. Hence they participate in the constant monitoring and remind themselves to fulfill others' expectations.

Users' engagement with the game mechanism of *SleepTown* is mixed with affective and cognitive work. Positive feedback techniques lead to positive emotions including surprise, happiness, satisfaction, the sense of control and achievement. Negative emotions triggered by punishment consist of guilt, regret, disappointment, and sadness. In particular, people under mutual surveillance feel more excited when reaching the common goal and getting a big reward for cooperation. Their feelings of dissatisfaction, guilt and shame are also amplified by the surveillance mechanism, when they recognize others or themselves do not fulfill the duties. Users also show critical appreciation of the functionality and aesthetics. They not only confirm the value of sleep-regulating function and game elements, but point out the details of the aesthetic design and game system that can be improved and make further suggestions.

When people regulate sleep through the game mechanism of *SleepTown*, both users' autonomy and non-human agency function. The app, smartphones, and digital technology are not passive objects but active actants that shape practices and produce effects. They all have agency to help translate and modify the meanings of sleep and game, as well as the relationship between them in the network. *SleepTown* can help users achieve certain goals, and also prevent them from doing certain things. On the one hand, smartphones and digital media technology make the app possible to function and attract people's attention. The application of gamification techniques is based on the material devices and technology. On the other hand, affordances of technology delimit the scope of app use. Different versions of

*SleepTown* may function differently on different devices with different operating systems. Only a part of users have the access to specific settings. Technical problems of apps or smartphones are also unavoidable, leading to confusion, disappointment, and tension.

### **‘Doing’ sleep in everyday life**

As *SleepTown* combines characteristics of self-tracking apps, productivity apps, and digital games, the app can be used as a multipurpose tool in everyday(night) life. Users’ engagement with it can be in various forms. Some users regard *SleepTown* as a sleep-regulating app, so they tend to strictly execute the game rule set by the app, to build a healthy sleep habit. Some users see *SleepTown* as a productivity app that helps them disconnect with distracting media, and manage their pre-sleep activities. Some players treat *SleepTown* as a pure city-building game or a collecting game. They develop different tactics to circumvent the sleep regulation and simply have fun.

Users’ engagement with *SleepTown* also varies in intensity. Some loyal followers actively participate in the self-optimization, striving to reach sleeping goals constantly. Some active players spend time collecting buildings, unlocking badges, and designing their Town. However, some normal users pause when they get tired of self-optimization, and get back when they want to avoid irregular sleep again. Some users are forced to disengage due to the loss or limitations of smartphones, or job requirements. There are also users who opt out when they find the app doesn’t fulfill their needs for sleep regulation or for entertainment.

Users share similar feelings about sleep regulation but hold different opinions about regulating sleep through digital media technology. They commonly mention the positive physical and mental state after having a regular sleep. They feel a sense of control and fulfillment when setting and reaching the sleeping goal. Some users take self-optimization via mobile apps for granted. Some reflect on the integration of technology into our lives and believe in humans’ wisdom for making use of technologies for good purposes. However, some users feel ambivalent about using phones to control phone use. They stay alert to the disciplinary power practiced by media technologies. In addition, some users question the result of sleep regulation through a commercial app that gamifies sleep. As in marketing discourse, gamification techniques aim to change the way people behave rather than how

people think (Schrape 2014: 22). *Sleeptown* only motivates intended behavior in a pleasant way, without appealing to the mind or reason. Users without a strong claim for sleep regulation easily forget their aims and get lost in the game. It becomes difficult for them to restart sleep regulation. Users also concern about the loss of control over their sleep data when their personal information is collected and can be exploited by commercial companies.

Not only users' sleep routine but also daily practices are affected by their engagement with *SleepTown*. Through positioning and regular use, the technology is gradually domesticated, integrated, and contained (Chambers 2016: 45). People's entertainment, social network, and consumption can be greatly influenced by their app use. First, *SleepTown* helps users develop pastime activities especially online ones. Users' creativity and imagination are boosted, when they are inspired to connect the game mechanism of *SleepTown* with online media platforms and digital games. People's pleasure and enjoyment thus last longer and are spread in a broader space. Second, *SleepTown* can maintain and expand users' social circle. The lack of in-app communication pushes users to reply on external communication channels, to recruit *Circle* members, discuss the Wonder and members' performance, share personal sleeping/gaming experiences, etc. The relationships between intimate friends or family can be strengthened when *SleepTown* becomes a new common discussion topic. *SleepTown* also motivates strangers to interact with each other, band together and pursue a common goal. Third, users may become more obsessive about consuming sleep and health. They can be encouraged to spend more money and time on the consumption of sleep and health. Staying in good health and enjoying a quality sleep are seen as morally correct behaviors or 'virtue'. Consuming sleep-related products and services is constructed as a major way to maximize personal attempts to fulfill biological needs as well as social expectations for ideal citizens.

### **Making sense of sleep in a digital age**

We all sleep in social structures (Crossley 2004). Sleep has been medicalized, commercialized, mediatized, digitalized, and gamified (Williams 2005; Lupton 2018; Ilhan et al. 2016). Not only the sleeping practice but our understanding of sleep is technologically mediatized by *SleepTown* and shaped by users' engagement. The meaning of sleep is shifted from biological to mediatized and commercial, from inactive to active, from boring to entertaining, from unproductive to productive, from physical to virtual, and from private to public.

Initially, *SleepTown* has transformed sleep from a universal biological necessity to an individualized entertaining experience. *SleepTown* follows the traditional game logic but uses it in an opposite way. Instead of encouraging players to actively interact with the interface such as clicking and scrolling, the construction of building is only activated by the player's inactive state. The game mechanism based on digital media creates double sleeping spaces, in which people are allowed to sleep and play a game at the same time - being 'inactive' in the physical world while 'actively' constructing a building in the virtual world.

Sleeping also becomes a game in which people compete with themselves and strive to be a better self every day. Sleepers are allowed to fail to have a regular sleep, because failure in game is less a punishment but more a reminder for self-improvement and a sign for getting closer to the success. Players are granted chances to improve even though they have to start again from the beginning. Time is lost and will never renew in the real world, but there is always a second chance for players to restart, achieve sleep goals and get rewards. Hence, sleeping is gamified as an attractive experience associated with entertainment, pleasure, and control instead of boredom and passivity.

Sleep is transformed into not just an entertaining game but a task contributing to productivity and efficiency. People expect the outcome of completing the 'sleep task', as they aim to feel vitalized and full of life after waking up so as to study or work more efficiently in the daytime. The surveillance function of *SleepTown* performs a useful tool to order individuals and thus impose efficiency and productivity. Users under surveillance internalize the external norms and discourses about healthy sleep, and remind themselves of the importance of sleep hygiene. Sleep is not simply a 'rest', but a 'preparation for being productive next day'. 'Getting sleep done (quickly)' gives people a sense of security and hope in their messy lives. If possible, some people want to sacrifice sleeping time for doing more 'meaningful' and 'productive' work. To some extent, people find a proper excuse for 'unavoidable' sleep deprivation in the fast paced society and convince themselves to adapt to it.

Users are obsessed with productivity and outcomes, as they expect to get sleep done in a quick but productive way. They expect to 'produce' something as a proof of the efforts they have made, or a result of a process. Even though the final outcome can be a destroyed building indicating 'failure', it doesn't prevent users from continuing their 'cultivation' or



‘production’ in the virtual world. A person’s energetic state after sleep is ‘invisible’ and ‘spiritual’. Only individuals themselves can feel it. However, the buildings in *SleepTown* visually represent users’ efforts to sleep regulation. Sleep is thus ‘materialized’ by the virtual buildings based on program code. People not only ‘feel’ the vitalized state, but also ‘see’ the representation of it and ‘share’ it with others through social media. Sleep becomes something that can be conducted ‘offline’ and ‘online’. Private information and experiences about sleep can be spread among friends as well as strangers. Sleep is thus no longer, or not merely, aligned with disconnection and secrecy, but rather with connection and publicity.

Sleep is negotiated within a dynamic network, both actual and virtual, of social influences and social relations (Williams 2005: 170). When sleeping is no longer about one person but a group of people in the same *Circle*, a networked rather an atomized or individualized notion of sleep is needed. Sleep, taking place at the interaction of a number of social circles, can be conducted through group work. Collaboration and team spirit are required when users make an effort to achieve a mutual goal. Sleep in part becomes collective action. Both friends and strangers are invited to cultivate sleeping as a gameful way to enhance social connectivity.

This thesis, as an in-depth study of a concrete case, has focused on the app of *SleepTown* and the users’ practices, giving insight into the concern about how gamification serves as a mode of governmentality and a surveillance apparatus in the digital era. Yet, *SleepTown* is not merely an example of gamification of sleep, but gives clues to how gamification and surveillance could be reconsidered and developed. For example, capitalism has expanded the proportion of social life that is open to surveillance. The mass surveillance in the future can be less manipulative but more subtle and entertaining due to the prevalence of gamification techniques. *SleepTown* gives us a warning about the rise of ‘surveillance capitalism’ (Zuboff 2019). It is the technology corporate that has the power to track and analyze our moment-to-moment existence from waking to sleeping. Every aspect of our lives can be predicted, shaped, gamified and monetized. Hence, there is a need to explore the production side in further studies. Conducting production interviews with the software developers and marketers for instance would be helpful to understand what norms and discourses are articulated and promoted by the tech companies. If we know the data extraction and predictive power of the corporates better, we may get more prepared to the continuously surveilled future.

## References

- Altheide, D. L. and Schneider, C. J., 2013., *Qualitative Media Analysis*. 2<sup>nd</sup> ed. Thousand Oaks, California: SAGE.
- Andrejevic, M., 2005. The Work of Watching One Another: Lateral Surveillance, Risk, and Governance. *Surveillance and Society*, 2(4), pp.479-497.
- Bazeley, P., 2013. *Qualitative Data Analysis: Practical Strategies*. London: SAGE.
- Becker, M., 1986. The Tyranny of Health Promotion. *Public Health Rev*, 14, pp.15-25.
- Bentham, J., 1843. *The Works of Jeremy Bentham (Vol. 4)*. Edited by J. Bowring. Edinburgh: William Tait.
- Bogost, I., 2014. Why Gamification is Bullshit. In S. P. Walz, & S. Deterding, eds. *The Gameful World: Approaches, Issues, Applications*. Cambridge, MA: The MIT Press. pp.65-79.
- Brennen, B., 2012. *Qualitative Research Methods for Media Studies*. New York: Routledge.
- Bueger, C. and Stockbruegger, J., 2016. Actor-Network Theory: Objects and Actants, Networks and Narratives. In D. R. McCarthy, ed. *Technology and World Politics: An Introduction*. Abingdon: Routledge. pp.1-16.
- Burr, V., 2015. *Social Constructionism*. 2<sup>nd</sup> ed. London: Routledge.
- Byrne, B., 2018. Qualitative Interviewing. In C. Seale, ed. *Qualitative Research Rractice*. 3<sup>rd</sup> ed. London: SAGE. pp.207-226.
- Chambers, D., 2016. *Changing Media, Homes and Households: Cultures, Technologies and Meanings*. London and New York: Routledge.
- Christensen, M. and Jansson A., 2015. Complicit Surveillance, Interveillance, and the Question of Cosmopolitanism: Toward a Phenomenological Understanding of Mediatization. *New Media & Society*, 17(9), pp.1473-1491.
- Conrad, P., 2007. *The medicalization of society: on the transformation of human conditions into treatable disorders*. Baltimore, Md.: Johns Hopkins University Press.
- Corner, J., 2011. *Theorising Media*. Manchester: Manchester University Press.
- Couldry, N. and Hepp, A., 2017. *The mediated construction of reality*. [e-book]. Cambridge: Polity Press.
- Crawford, R., 1980. Healthism and the medicalization of everyday life, *International Journal of Health Services*, 10, pp.365-388.
- Crossley, N., 2004. Sleep, Reflexive Embodiment and Social Networks. *The First ESRC*

- '*Sleep and Society*' Seminar. Warwick, UK, 3 December 2004. UK: University of Warwick.
- De Certeau, M., 1984. *The Practice of Everyday Life Vol. 1 The Practice of Everyday life*. Berkeley: University of California Press.
- Deleuze, G., 1992. Postscript on the Societies of Control, *October*, 59, pp.3-7.
- Dement, W. C. and Vaughan, C., 2000. *The Promise of Sleep: A Pioneer in Sleep Medicine Explores the Vital Connection Between Health, Happiness, and a Good Night's Sleep*. New York: Dell.
- Deterding, S., Khaled, R., Nacke, L. E. and Dixon, D., 2011. Gamification: Toward a definition. *CHI 2011 Gamification Workshop Proceedings*. Vancouver, BC, Canada. 7-12 May 2011. Vancouver: The Gamification Research Network.
- Exelmans, L. and Van den Bulck, J., 2019. Sleep Research: A Primer for Media Scholars, *Health Communication*, 34(5), pp.519-528.
- Flyvbjerg, B., 2001. *Making social science matter: why social inquiry fails and how it can succeed again*. Cambridge: Cambridge University Press.
- Foucault, M., 1973. *The Birth of the Clinic: An Archaeology of Medical Perception*. London: Routledge.
- Foucault, M., 1975. *Discipline and Punish: The Birth of The Prison*. New York: Vintage.
- Foucault, M., Burchell, G., Gordon, C. and Miller, P., 1991. *The Foucault Effect: Studies in Governmentality : With Two Lectures By and An Interview with Michel Foucault*. Chicago: University of Chicago Press.
- Foucault, M., Senellart, M. and Davidson, A. I., 2007. *Security, Territory, Population: Lectures at the Collège de France, 1977-1978. Michel Foucault*. Edited by M. Senellart. Hampshire: Palgrave Macmillan.
- Fuchs, M., 2014. Predigital Precursors of Gamification. In M. Fuchs, S. Fizek, P. Ruffino and N. Schrape, eds. *Rethinking Gamification*. Lueneburg: Meson Press. pp.119-140.
- Gibson, J., 1967. Theory of Affordances, In Shaw, R. and Bransford, J., eds. *Perceiving, Acting, Knowing*. New York: Erlbaum. pp.67-82.
- Gregg, M., 2018. *Counterproductive: Time Management in the Knowledge Economy*, Duke University Press, Durham.
- Hall, S., 1997. Introduction, In S. Hall, ed. *Representation: Cultural Representations and Signifying Practices*. London: Sage. pp.1-11.
- Harmat, L., Takacs, J. and Bodizs, R., 2008. Music Improves Sleep Quality in Students. *Journal of Advanced Nursing*, 62, pp.327-336.
- Henry, D., Knutson, K.L. and Orzech, K.M., 2013. Sleep, Culture and Health: Reflections on

- the Other Third of Life, *Social Science & Medicine*, 79, pp.1-6.
- Hill, A., 2017. Reality TV Engagement: Reality TV Producers and Audiences for Talent Format *Got to Dance*. *Media Industries*, 4(1), pp.1-17.
- Ilhan, E., Sener, B. and Hacıhabibog, lu, H., 2016. Creating Awareness of Sleep-Wake Hours by Gamification, In A. Meschtscherjakov, B. De Ruyter, V. Fuchsberger, M. Murer and M. Tscheligi. eds. *11th International Conference on Persuasive Technology*. Switzerland. 11 March 2016. Switzerland: Springer. pp.122-133.
- Inglis, D. and Thorpe, C., 2019. *An Invitation to Social Theory*. 2<sup>nd</sup> ed. Cambridge: Polity Press.
- Kelly, J. M., Strecker, R. E. and Bianchi, M. T., 2012. Recent Developments in Home Sleep-Monitoring Devices, *ISRN Neurology*, pp. 1-10.
- Latour, B., 2005. *Reassembling the Social*. Oxford: Oxford University Press
- Law, J., 2007. Actor Network Theory and Material Semiotics, In B. S. Turner ed. 2009. *The New Blackwell Companion to Social Theory*. Oxford: Blackwell. pp.141-158.
- Lorber, J., 1993. Believing is Seeing: Biology as Ideology, *Gender and Society*, 7(4), pp.568-581.
- Lupton, D., 2014. Apps as Artefacts: Towards a Critical Perspective on Mobile Health and Medical Apps, *Societies*, 4(4), pp.606-622.
- Lupton, D., 2016. *The Quantified Self: A Sociology of Self-Tracking*. [e-book]. Malden, MA: Polity
- Lupton, D., 2018. *Digital Health: Critical and Cross-Disciplinary Perspectives*. London: Routledge
- Madsen, O.J., 2015. *Optimizing the Self: Social Representations of Self-Help*. London: Routledge.
- Matallaoui, A., Hanner, N. and Zarnekow, R., 2017. Introduction to Gamification: Foundation and Underlying Theories. In S. Stieglitz, C. Lattemann, S. R. Bissantz, R. Zarnekow and T. Brockmann, eds. *Gamification: Using Game Elements in Serious Contexts*. Switzerland: Springer. pp.3-18
- Mathiesen, T., 1997. The Viewer Society: Michel Foucault's "panopticon" revisited. *Theoretical Criminology*, 1(2), pp.215-234.
- Maturo, A. F. and Moretti, V., 2018. *Digital Health and the Gamification of Life: How Apps Can Promote a Positive Medicalization*. Bingley: Emerald.
- Maturo, A. and Setiffi, F., 2016. The Gamification of Risk: How Health Apps Foster Self-Confidence and Why This Is Not Enough. *Health, Risk & Society*, 17(7-8), pp.477-494.

- McGonigal, J., 2011. *Reality Is Broken: Why Games Make Us Better and How They Can Change the World*. New York: Penguin Books.
- O'Malley, P., 2009. Responsibilization. In A. Wakefield and J. Fleming, eds. *The SAGE dictionary of policing*. London: Sage. pp.276-278.
- Partien, M. and Hublin, C., 2000. Epidemiology of sleep disorders, In M.H. Kryger, T.Roth and W.C. Dement, eds. *Principles and practice of sleep medicine*. 3<sup>rd</sup> ed. Philadelphia/London: W.B. Saunders.
- Raessens, J., 2014. The Ludification of Culture. In M. Fuchs, S. Fizek, P. Ruffino and N. Schrape, eds. *Rethinking Gamification*. Lueneburg: Meson Press.
- Rey, P. J., 2014. Gamification and Post-Fordist Capitalism. In S. P. Walz, & S. Deterding, eds. *The Gameful World: Approaches, Issues, Applications*. Cambridge, MA: The MIT Press. pp.277-296.
- Rivas, C., 2012. Coding and Analysing Qualitative Data. In C. Seale, ed. *Qualitative Research Practice*. 3<sup>rd</sup> ed. London: SAGE. pp.366-392.
- Rose, N., 1999. *The Powers of Freedom: Reframing political thought*. Cambridge, UK: Cambridge University.
- Schell, J., 2008. *The Art of Game Design*. Burlington: Morgan Kaufmann Publishers.
- Schrape, N., 2014. Gamification and Governmentality. In M. Fuchs, S. Fizek, P. Ruffino and N. Schrape, eds. *Rethinking Gamification*. Lueneburg: Meson Press. pp.21-46.
- Schwartz, B., 1970. Notes on the Sociology of Sleep. *The Sociological Quarterly*, 11(4), pp.485-499.
- Seale, C., 2018. Sampling. In C. Seale, ed. *Qualitative Research Practice*. 4<sup>th</sup> ed. London: SAGE. pp.155-174.
- Sicart, M., 2014. Playing the Good Life: Gamification and Ethics. In S. P. Walz, & S. Deterding, eds. 2014. *The Gameful World: Approaches, Issues, Applications*. Cambridge, MA: The MIT Press. pp.225-244.
- Silverstone, R. and Hirsch, E. eds., 1992. *Consuming Technologies: Media and Information in Domestic Spaces*, London: Routledge.
- Silverstone, R. and Haddon, L., 1996. Design and the Domestication of Information and Communication Technologies: Technical Change and Everyday Life. In R. Silverstone and R. Mansell, eds. *Communication by Design: The Politics of Information and Communication Technologies*, Oxford: Oxford University Press, pp.44-74.
- Silverstone, R., 2006. Domesticating Domestication. In Berker, T., Hartmann, M., Punie, Y. and Ward, K., eds. *Domestication of Media and Technology*. London: Open University

- Press, pp.229-248.
- So, H. J. and Seo, M., 2018. A Systematic Literature Review of Game-based Learning and Gamification Research in Asia. In K. J. Kennedy and J. C. Lee, eds. *Routledge International Handbook of Schools and Schooling in Asia*. New York: Routledge. pp.396-412.
- Svensson, D., 2019. *Digital wellbeing, according to Google*. Master thesis. Lund University. Available at: <<http://lup.lub.lu.se/student-papers/record/8976353>> [Accessed: 17 January 2020]
- Syvertsen, T. and Enli, G., 2019. Digital Detox: Media Resistance and The Promise of Authenticity, *Convergence*. pp.1-15.
- Syvertsen, T., 2020. *Digital Detox: The Politics of Disconnecting*, [e-book]. Emerald Publishing Limited, Bingley.
- Taylor, B., 1993. Unconsciousness and Society: The Sociology of Sleep, *International Journal of Politics, Culture & Society*, 6(3), pp.463-471.
- Thaler, R. and Sunstein. C., 2008. *Nudge: Improving Decisions About Health, Wealth and Happiness*. New Haven: Yale University Press.
- Urquhart, I. E., 2018. *Power Nap: Visualising Sleep and Neoliberal Governmentality*. Master thesis. Lund University. Available at: <<http://lup.lub.lu.se/student-papers/record/8945849>> [Accessed: 17 November 2019]
- Valtonen, A. and Moisander, J., 2012. Great Sleep as A Form of Hedonic Consumption, *Advances in Consumer Research*, 40, pp.436-441.
- Walz, S.P. and Deterding, S. eds., 2014. *The Gameful World: Approaches, Issues, Applications*. Cambridge, MA: The MIT Press.
- Whitson, J. R., 2013. Gaming the Quantified Self. *Surveillance & Society*, 11(1/2), pp.163-176.
- Whitson, J. R., 2014. Foucault's fitbit: Governance and gamification. In S. P. Walz, & S. Deterding, eds. 2014. *The Gameful World: Approaches, Issues, Applications*. Cambridge, MA: The MIT Press. pp.339-358.
- Williams, S. J., 2005. *Sleep and Society: Sociological Ventures into the Un(known)*. London: Routledge
- Williams, S. J., 2011. *The Politics of Sleep: Governing (Un)consciousness in the Late Modern Age*. Basingstoke: Palgrave Macmillan
- Williams, S., Meadows, R. and Arber, S., 2011. The Sociology of Sleep. In Cappuccio, F. P., Michelle A. M., and Steven W. L., eds. 2011. *Sleep, Health and Society: From Aetiology*

to *Public Health*. Oxford: Oxford University Press. Ch.19

- Williams, S., Coveney, C. and Meadows, R., 2015. “M-apping” sleep? Trends and transformations in the digital age, *Sociology of Health & Illness*, 37(7), pp.1039-1054.
- Xu, T., 2017. Build sleep habits: construct one building per night. *QDaily*, [online] Available at: < <http://www.qdaily.com/articles/40596.html> > [Accessed: 18 March 2019] (In Chinese)
- Zimmerman, F., 2008. *Children’s Media Use and Sleep Problems: Issues and Unanswered Questions. Research Brief*. Menlo Park, CA: Kaiser Family Foundation.
- Zicherman, G., 2011. A Long Engagement and a Shotgun Wedding: Why Engagement is the Power Metric of the Decade. *Gamification Summit*. [presentation]. 21-22 January 2011. San Francisco, CA.
- Zichermann, G. and Cunningham, C., 2011. *Gamification by Design: Implementing Game Mechanics in Web and Mobile Apps*. Sebastopol, CA: O’Reilly Media.
- Zuboff, S., 2019. *The Age of Surveillance Capitalism: The Fight for the Future at the New Frontier of Power*. London: Profile Books.

## **Empirical images**

Figure 1, 2, 10 are images downloaded from the official website of *SleepTown*  
<https://sleeptown.seekrtech.com>

Figure 3, 5, 8, 9, 14, 15, 16, 17, 18 are images offered by the interviewees

Figure 4, 6, 7, 11, 12, 13 are screenshots of the author’s app

## Appendices

### Appendix 1: Lists of interviewees

*(Information was collected before conducting the interview)*

Name*	Age	Sex	Occupation	Whether to use the app <i>now</i>	Duration of usage	Frequency of usage (per week)	Mobile operating system
Z <i>(piloting)</i>	25	Female	Master student	Yes	8 months	2-3 times	IOS
L	20	Female	Bachelor student	Yes	6 months	5-7 times	Android
Q	17**	Male	High school student	No	9 months	7 times	Android
P	23	Female	Master student	Yes	2 years	6 times	IOS
W	23	Female	Administrator	Yes	9 months	6-7 times	IOS
X	17**	Male	High school student	Yes	1 year	7 times	Android
Y	22	Female	Bachelor student	Yes	18 weeks	5-7 times	Android
K	21	Female	Bachelor student	Yes	3 months	7 times	IOS
R	26	Female	Product designer	No	4 weeks	3-4 times	IOS
I	22	Female	Administrator	Yes	1 year	7 times	Android
M	21	Female	Bachelor student	Yes	1.5 years	5-7 times	IOS
F	22	Female	Bachelor student	Yes	4 months	More than 5 times	Android
D	24	Female	Digital marketer	Yes	1 month	7 times	IOS

\*The name is the initial of the interviewee's *WeChat* nickname.

\*\*The two 17-year-old interviewees volunteered to participate in the interview. They were fully informed about the research aims, and signed the consent form in advance. During the interview, they understood the questions well and gave rich information about their app use.



## Appendix 2: Consent form



### Consent form

Master's Thesis

Master in Media and Communication Studies

Lund University, Sweden

Project: The gamification of sleep and mobile apps

This research seeks to investigate the gamification of sleep and mobile apps in China. We will ask questions regarding experiences of being a user of *SleepTown*. Each interview will last around 1 hr. The data will only be used within the confinement of the student's Master thesis.

I would like to record the interview and use the dialogue to present my findings.

I will record the interview only with your written consent. Please feel free to say as much or as little as you want. You can decide not to answer any question, or to stop the interview any time you want. All citations from the interview will be translated into English and will be anonymized.

*I hereby testify that I have been informed about the purpose of the study and the conditions for participation, and give my consent to participate and the use of transcripts as stated above.*

Full name

Signature

Date

Student: Yukun You ([Yu7712yo-s@student.lu.se](mailto:Yu7712yo-s@student.lu.se))

Supervisor: Helena Sandberg ([Helena.sandberg@kom.lu.se](mailto:Helena.sandberg@kom.lu.se)) Associate Professor in Media and Communication

## Appendix 3: Interview guide

### Context

How did you start to use *SleepTown*?

Could you describe to me what you do in the app, and how it works?

How does SleepTown influence your daily routine?

Do you share your experiences of using *SleepTown* with others? What makes you (not) do it?

### Application

If you recommend SleepTown to your friends or family, how would you describe it?

How would you describe your using experiences?

What do you find appealing and joyful with the app?

Discuss experiences of using other self-tracking or productivity apps or products.

### Sleep

Do you have sleep problems?

How do you define 'healthy sleep'?

What is the value of 'healthy sleep' in your everyday life?

How can you achieve 'healthy sleep'?

How does *SleepTown* influence your understanding of sleep?

How does *SleepTown* help you achieve better sleep?

### Phone detox and productivity

One function of *SleepTown* is to help users get rid of phone addiction. What do you think about this function?

How do you understand the practice of 'using phone to limit phone use'?

One function of *SleepTown* is to improve users' productivity in the daytime. What do you think about this function?

Are you aware that there are commercial interests behind the app? How do you think about it?

### Gamification

How do you like the game design (e.g. visuals, interface...) in *SleepTown*?

Could you show me your *Town*? Tell me about it.

Tell me about your experiences/thoughts about the function of *Tickets*.

Tell me about your experiences/thoughts about the function of *Circle*.

Tell me about your experiences/thoughts about the setting of *Strict Mode*.

## **Engagement**

Do you remember what emotions come up to you when you get rewards? How about being punished?

How do you feel when customizing your own *SleepTown*?

How do these emotions influence your sleep pattern or daily life?

Discuss strategies for getting more rewards/circumventing sleep regulation.

Have you found something disappointing? (why, how to deal with it)

Have you experienced any tension or conflict when using *SleepTown*? How do you deal with it?

Have you ever thought about stopping using *SleepTown*? Why (not)?

(OR: Talk about your disengagement: motivations, whether to come back, changes of sleep routine/daily practice, replacement...)

How would you react if *SleepTown* disappears?

Thanks for your time. This is all for now.

Is there anything that you want to add?

Could you please send me screenshots/links of what you mentioned (e.g. Town/posts/bugs/...)?

If I have further questions or need a clarification, is it okay to get back to you?

## Appendix 4: An example of interview transcript

An interview with X (male, 17 years old, high school student)

### **How did you start to use *SleepTown*?**

It was a long time ago when I saw this app in the app store. I thought the app idea was good. You can set a sleeping goal and keep a regular sleep schedule to go to bed early and get up early. There will be a reward everyday. You can get different buildings and surprises every day. I use the app mainly for sleep regulation, for better health.

### **Describe what you do in the app.**

I set the bedtime goal as 11:20pm and wakeup goal as 6:30am. I usually wash up around 8:30pm and then watch some news. At 9:30pm, I click the 'sleep' button in SleepTown, put down the phone, and sack out. I set an alarm on my phone for 6:26am. I will wake up a few minutes before the wakeup goal and then click the 'wake up' button.

### **How does SleepTown influence your daily routine?**

During the daytime, when I was free, I dragged the newly built constructions to The Big Town, and arranged them in the Town. I didn't select a specific period for doing these. It just took me a few minutes. Users can only get one house per night, so I simply add it to the Town and arrange it. I don't open SleepTown very frequently.

### **Do you share your experiences of using *SleepTown* with others?**

I once talked it with my friend. Maybe he was a bit interested in it. However, I lived at home but he lived in the school dormitory. He just said his phone had low storage and didn't download it. My brother also downloaded it. I also recommended it to my class teacher. He was interested in it and downloaded it. He was very nice, different from students in my class. The students get used to irregular lives. They often played games until midnight. It was difficult to persuade them to use the app. I once hoped the class teacher could recommend this app to the whole class, but this goal was not easy to reach due to the large number of students. I did imagine that if the teacher liked the app he could recommend it to the students. If every student uses the app and each 15 students form a Circle, we will know members who don't contribute to the Wonder. Maybe they play on their phones at night. I also shared the app with others on Weibo. I talked with others about the app on WeChat and posted screenshots of constructed buildings to Moments of WeChat.

### **If you recommend SleepTown to your friends or family, how would you describe it?**

I cannot remember clearly how I recommended it to others before. I just told others the interesting elements of it. For example, the app is very interesting and can regulate our life. I mainly talked about the good and unique features of it, in order to attract my friends to use it. If someone asks my using experiences, I will use my own experiences to convince them.

### **What do you find appealing and joyful with the app?**

The most attractive points of the app depend on my own need. I just wanted to regulate my life and the app satisfies my need. I can also get some rewards and surprises. If you want to regulate life, you may use it. However, if you don't want to have a regular life, others' words don't matter. One's own subjective intention is more important.

**Discuss experiences of using other self-tracking or productivity apps or products.**

After using the app I also bought a watch to track sleep. It shows your deep sleep in deep color and light sleep in light color. I once search deep sleep on the Internet and it showed that short deep sleep leads to poor memory. I was so worried about my short deep sleep and thus paid more attention to sleep. The watch can record my heart beat and ... something about heart, blood, reflection... I am not sure. I also use another app produced by the same company called Forest. I open an app called Fortune City (记账城市) more frequently in the day time than opening SleepTown. I can use it to record all my expenses. For example, if you spend money shopping, you can select the category of 'shopping' and input the amount. The app will construct a house for you, and you can get maximum 5 buildings per day. Compared to the Town in SleepTown, the City in Fortune City are more lively. There are citizens and cars in the City. I mainly use SleepTown to regulate my life. That's why I am still using it. Moreover, it gives me a little surprise or a reward every time. This is also a motivation.

**Do you have sleep problems?**

I used to play on my phone, watching videos or reading fictions until late night. In the morning I would feel sleepy and wanted to have more sleep, and get up very late.

**How do you define 'healthy sleep'?**

Having enough sleep, between 7-8 hours. I think this duration is healthy. Besides duration, your emotions, what you eat or drink before sleep, your bed, and weather also matter. The sleeping environment is important. For instance you cannot fall asleep when hearing a loud noise.

**What is the value of 'healthy sleep' in your everyday life?**

The healthy sleep helps me stay awake and energetic in the daytime. I won't feel sleepy when reading or running in the morning. If you do not sleep well, you will be lazy. You cannot focus on reading and easily nod off. You may want to wake up early and go running in the morning, but you feel very sleepy at that time and just comfort yourself and continue sleeping.

**How can you achieve 'healthy sleep'?**

If there is a noise, you can buy earplugs. To sleep more comfortably, you may take a hot shower or foot bath, so as to relax your body and go to bed. Sometimes you can also listen to relaxing music. I think sleep is important for the company, society, school, because the society is constituted by individuals. If everyone is sleepy everyday and lack of productivity, they cannot reach goals, thus blocking the development of economy, culture, and every aspect of society. However, I don't think companies pay attention to employees' sleep. They just care about their own interests and profits. The government....hmm...can limit the cars in the residential area. For example, big trucks are not allowed to enter residential blocks or not allowed to use the horn in these areas to interrupt citizens' sleep.

**How does *SleepTown* influence your understanding of sleep?**

Before I didn't pay attention to sleep. Then I gradually realized the importance of health and value good sleep. Also I think SleepTown as an app is very interesting. I can build my own house and immerse myself in the environment as a Mayor. As you construct a building everyday and play a role of Mayor, you have a responsibility to do these things well.

**How does *SleepTown* help you achieve better sleep?**

It mainly regulates my sleep. My sleep schedule becomes more regular. I used to do things until very late and fail to get up early in the morning. I easily nodded off before. Now I can get up earlier and

have more time to arrange my daily schedule.

**One function of *SleepTown* is to help users get rid of phone addiction. What do you think about this function?**

Yes, it functions. The app helps me put down my phone and go to bed early.

**How do you understand the practice of ‘using phone to limit phone use’?**

I think I can save more time and do not waste time anymore. If I cannot stop watching short videos on Tiktok at night, I won't sleep well. My study will be affected by this next day. My life is effectively regulated after the app limits my phone use and reminds me that ‘it's time to stop playing and go to bed’. Sometimes ... you just don't want to get up when the alarm clock rings. You comfort yourself that ‘just sleep longer’ ‘it's holiday anyway’ ‘oversleeping is not a big deal’, and then lie down and continue sleeping. It is your inner mind that guides your action. In fact, if you get up directly and confirmingly, you won't be that sleepy and won't get back to your bed. We should go back to one's own subjective intention. How the app works depends on your agency - whether you want to plan your life or not. Your own subjectivity is very important. You have to make a strong decision.

**One function of *SleepTown* is to improve users' productivity in the daytime. What do you think about this function?**

Yes, it works. Like I said before, the app helps me stay awake and energetic in the daytime. I won't feel sleepy when reading or running in the morning.

**How do you think about the commercial interests behind the app?**

The producers have to make a living. Spending 12 yuan unlocking all the app functions and helping your sleep regularly is not bad, as long as you intend to obtain a regular life. The app is awesome as it gives users encouragement and motivates them to continue sleeping regularly. *SleepTown* worth it. I think designers want to help users stay healthy through the app. The amount of money is reasonable. For example, the app design is simple without in-app adverts, unlike other apps that are free to download but make profits from adverts. The designer group's efforts deserve the money. *SleepTown* promises that there will be no in-app adverts.

Recently I contacted the producers and wished them to add more ... like characters, cars, weathers to the *Town*. I also collected ideas from the netizens. I talked with some users on Weibo via private messages. I also made a post on Super Topic of *SleepTown* on Weibo. Some users made comments under the post. I asked some users if they agree to unlock these new elements by spending 2 yuan or watching a few adverts, and they said no problem. I made such suggestions because as time went by, I recognized that the *Town* looks strange in some aspects. You had a few buildings and facilities in town, but there was no people, car, or weather. It was so strange. Some users expressed similar ideas online. Hence I collected our thoughts and sent an email to the producers. They replied me two days later and said it's a good idea and they would sent it to the technical department for their references. I think they need money to develop the game elements, as it relates to the technology innovation. They need money and people to complete it. It sounds unfair when producers spend time and energy innovating the game but gain nothing.

**Would you mind your data is collected and used by a commercial company?**

I don't mind my sleep data is used by the company, because I don't think the data such as when I go to bed is valuable. Other apps or self-tracking devices that monitor your sleep accurately can offer valuable data.

**How do you like the game design (e.g. visuals, interface...) in *SleepTown*?**

I think the artistic design is fine. However you gradually find that there are a few things missing in the Town. Like I said before, there is no people, cars and weathers. It's so normal and not lively. Like some netizens suggested, it would be interesting to see the weather of your SleepTown reflects the real weather in your city in the real life. It would make you more engaged and inspire your creativity in Town design.

**Could you show me your *Town*? Tell me about it.**

I plan the Town following the city plan in the real world. I have hundreds of buildings now and I divide the town into residential districts, commercial districts, and industrial districts.

**Tell me about your experiences/thoughts about the function of *Tickets*.**

I used the tickets and collected tickets by constantly clocking in for 7 days. If I use a ticket, I will be more looking forward to the next-day building, and be more careful when clicking buttons.

**Tell me about your experiences/thoughts about the function of *Circle*.**

I built a Circle and there are three people inside, me, my brother and one net friend. The net friend was the first one who had discussed the elements in the Town with me. I asked him if he had joined any Circle or wanted to join one, and he said yes. That's how I added him. I also invited my class teacher but he may not know how to join a Circle and didn't make it. I invited my class teacher because I think he keeps a regular sleep, because I once called him and he didn't pick up the phone and slept early. I don't feel pressured inviting a teacher as we are equal and I have a regular sleep schedule. I think we can sleep 'together' peacefully. I once thought about adding more people in the Circle, but then I recognized it was too bothering. Hence I didn't make posts online to recruit more people. If you invite others, you have to spend time on recruitment. You have to edit the text and image to make your post attractive. Others' replies also take time. You will check your phone every thirty minutes. While checking the replies, you can be easily distracted by news or other information. You will immerse yourself in a 'toxic circle', spending a large amount of time and energy on it.

It's interesting to build a Wonder, as Wonders are beautiful and splendid. I felt all of us contributed to the Wonder construction. Once something wrong went on my brother's phone and he could not contribute to it but I felt it was all right. He tried his best. It's not a problem. The other net friend contributed to the Wonder constantly on time.

**Tell me about your experiences/thoughts about the setting of *Strict Mode*.**

There is no Strict Mode on Android system, so the rule is always strict for me, which means the building will be destroyed once I leave the app. It forces me to sleep and wake up on time.

**Talk about the emotions came up to you when you got rewards, and punished.**

You will feel happy when you get a fancy building, but you feel nothing when get a normal house such as a single-storey house. I felt confused when my building was destroyed several days ago. I got up at 6.30am on time and it showed the interface of a newly constructed building. I didn't leave the app, but put down my phone and went running. However, when I came back and check the phone, it showed that the building was destroyed, maybe because I didn't connect with the Wi-fi network that day. The building was not synchronized automatically and thus fell down. It should be the app bug. I felt a bit sad but more confused. Then I contacted their customer service but they haven't figured it out yet. To avoid such things, I just connected my phone with the Wi-fi network every night.

**How do you feel when customizing your own Town?**

Like I said before, I feel a sense of responsibility when planning my Town as I am the only Mayor who designs it. I think it's would be better if they add more lively elements like people, cars, and weather to the Town. We will feel more engaged and be more creative.

**How do these emotions influence your sleep pattern or daily life?**

The feelings do really affect my sleep or life. They just disappear quickly. Maybe the sense of surprise brought by fancy buildings motivates me to continue collect buildings, but I will keep use it anyway as I want to keep a regular sleep.

**Discuss strategies for getting more rewards/circumventing sleep regulation.**

You can get tickets by inviting new users. If you invite one user and he/she enters your referral code, you will get a ticket. If you use the ticket before clicking the button of 'sleep', you will have more chances to get a rare building such as a power station or fairground or restaurant next morning.

**Talk about satisfaction and dissatisfaction, and how to deal with these feelings.**

As I mentioned before, I think the Town can be improved better. I wanted to share our suggestions with the producers. At first I wanted to contact them via Weibo, but their Weibo account is a robot with automatic replies. I didn't expect they check the message. However, I got the email address of customer service from the robot. I also found an email address for business cooperation. Hence I sent an email to the customer service address. They didn't reply me in after one or two days, so I searched on Google Play and found another official email address of SleepTown and sent an email again. After two days, I got the reply from them for the first email. They thought it's a good idea and sent it to the technical department for their references. After two days, I thought maybe they didn't have enough motivations for innovation, so I send another email to their business cooperation mailbox. I listed three plans: First, users can spend 2 to 5 yuan unlocking the new elements of characters, cars, etc. Second, users can watch 5-10 adverts in the app to unlock the new features. Third, it's good to enjoy the new elements for free. I also wrote a few words expressing my gratitude in the end. After two days I got the reply and they said they would sent it to the relevant department for references.

**Have you ever thought about stopping using *SleepTown*? Why (not)?**

Not yet, because the app closely associates with my early bedtime and regular sleep.

**How would your react if *SleepTown* disappears?**

I will feel something missing in my life. My sleep more or less will be affected. I may not find other similar apps in the near future because you get used to this app. You won't feel the same way when using other apps.

**Thanks for your time. This is all for now. Is there anything that you want to add?**

Not really.

**Could you please share your Town, Circle, and materials about the suggestions you made with me?**

Sure. I will send them to you later.

**If I have further questions or need a clarification, is it okay to get back to you?**

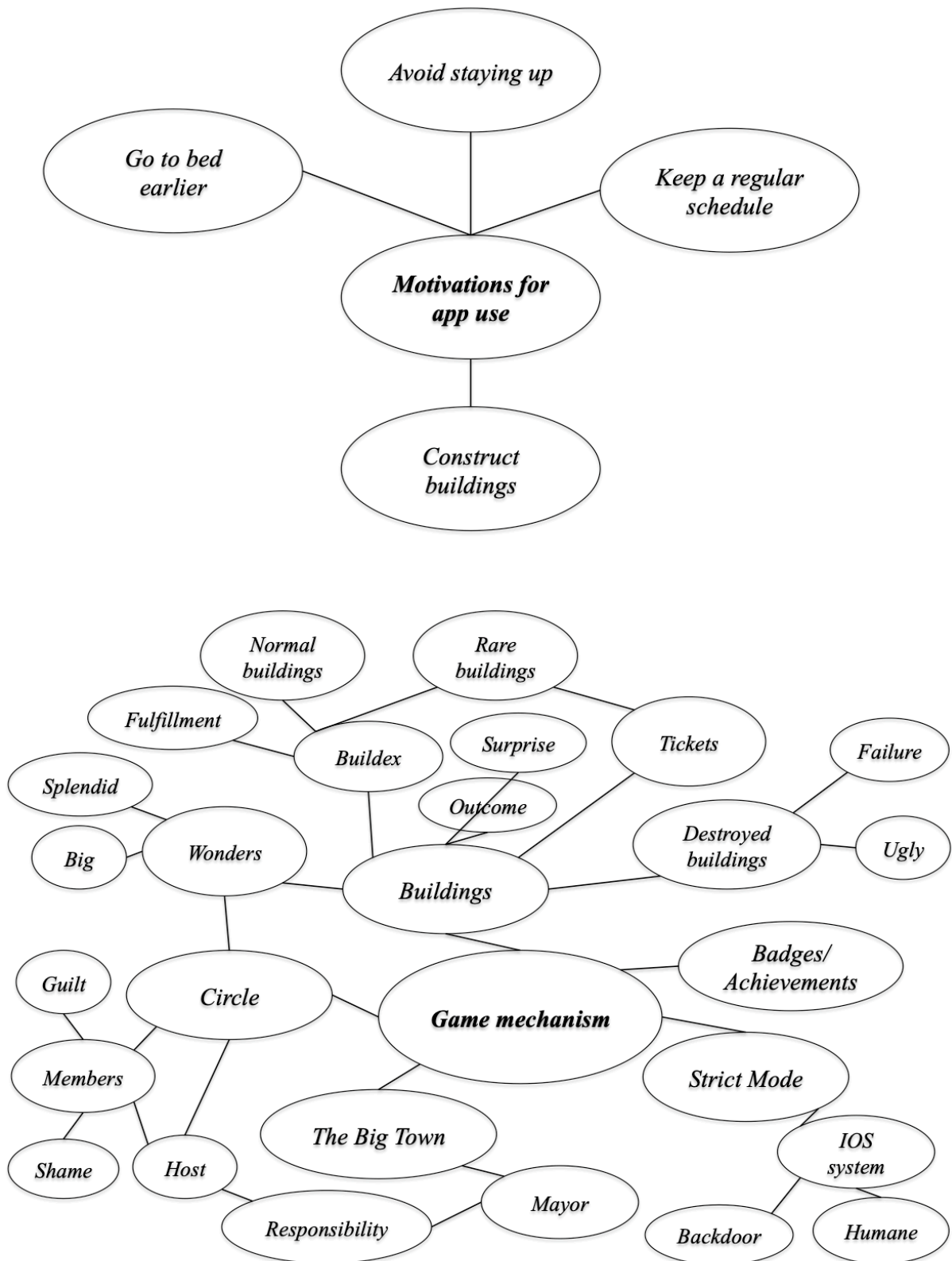
No problem.



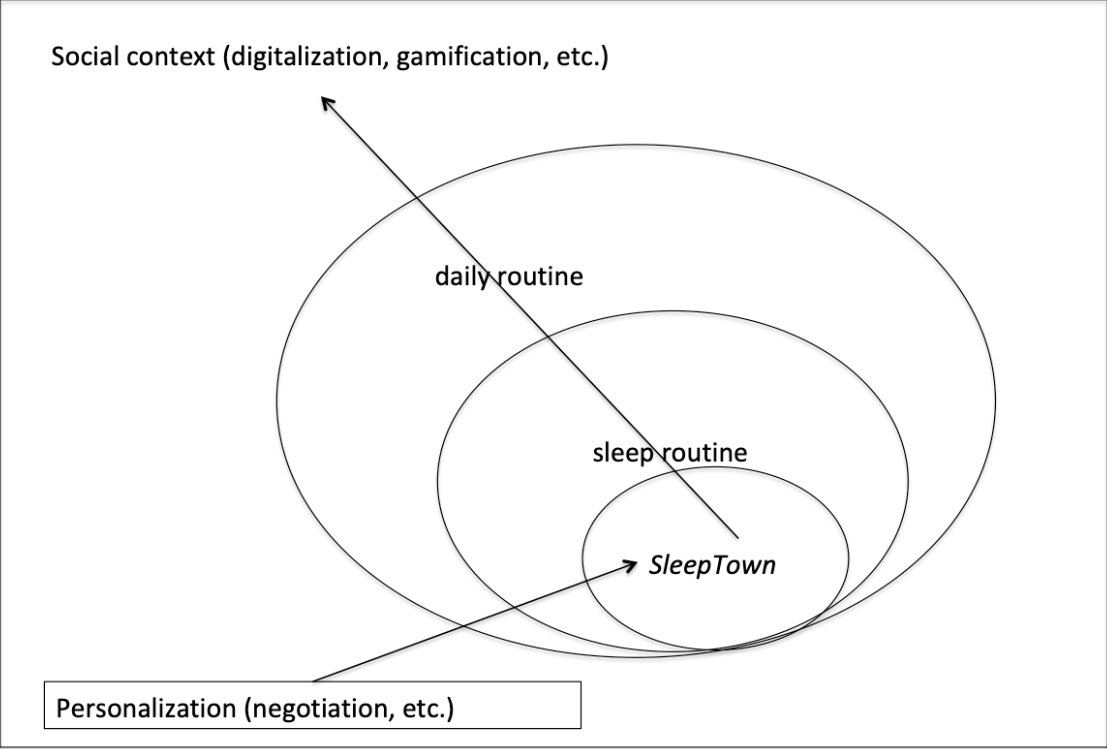
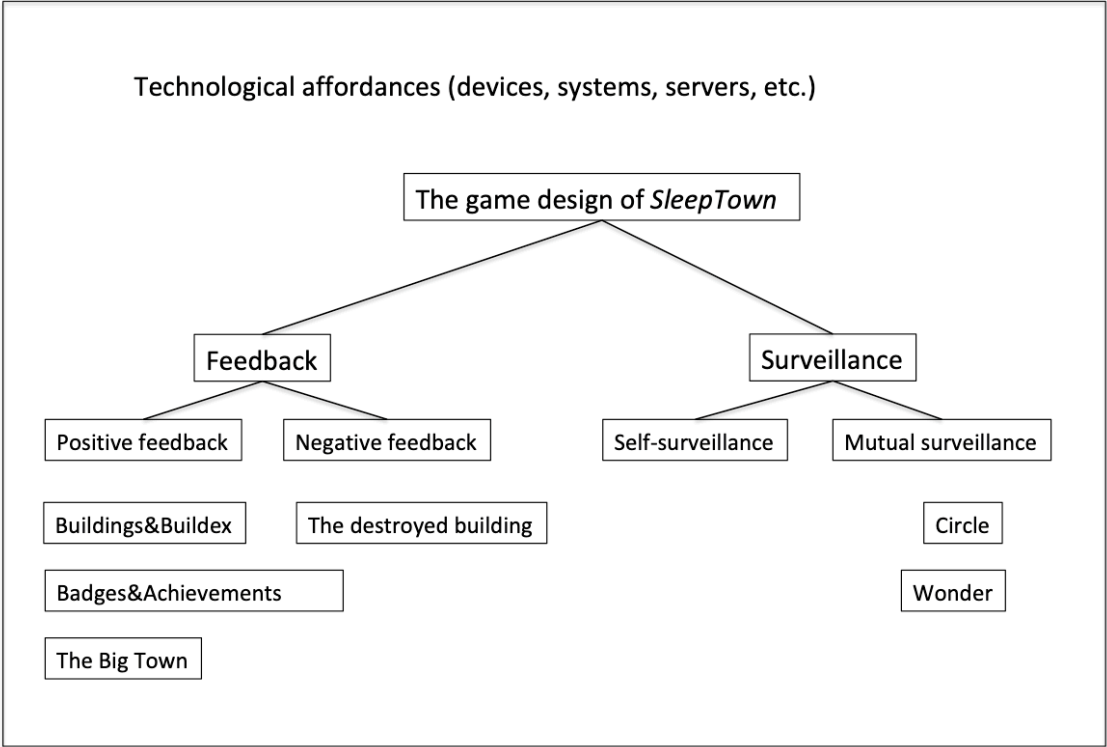
## Appendix 5: An example of coding process

Theme	Category	Sub-category	Code (translated from Chinese)
Game mechanism	Feedback mechanism	Building	(constructed) good-looking, tiny, fancy, attractive, designed well, zoom-in, in great detail, dream architecture; fresh, happy, excited, a sense of achievement, satisfaction, control; surprise, proof, surprise, reward ... .. (destroyed) ugly, bad-looking, realistic, like a construction site; disappointed, sad, not pleasant, confused, guilty, regret, feel nothing, get used to it; punishment; remind myself to not stay up; self-reflection ... ..
Sleep routine	Pre-sleep rituals	/	click the 'sleep' button before sleep; disconnect with phones; brushing teeth; reading books; watching films; calm down and be relaxed; reading books; practicing meditation; turn on sleeping mode; prepare my mind for sleeping
Daily practices	Social network	/	recommending the app/Circle to classmates/brother/class teacher/colleagues; forming a Circle with close friends; making posts on Super Topic of SleepTown on Weibo to recruit members; expanding social network via Weibo; following each other on Weibo; uploading Vlogs to Bilibili to find someone to form a Circle; opening a groupchat with strangers on Wechat; creating a special groupchat with friends on WeChat to discuss the app, share experiences, or trash talk
User engagement	Resistance	Tactics	(IOS) turning off the Strict Mode (playing on the phone); (Android) using technical bugs, closing the app in the background (listening to NetEase Music, checking Weibo), close the app in the background; resetting time zone on the phone; using other phones/laptops (binge-watching, browsing the forum, making posts via a laptop)

## Appendix 6: Examples of spider map



# Appendix 7: Examples of mind maps



## Appendix 8: The screenshot of recruitment advertisement on *Weibo*



(*SleepTown* Super Topic)

*SleepTown* fellows attention~ Come and get a cup of milktea

I am doing a case study of *SleepTown* for my Master thesis. The topic is about the gamification of sleep and relationships between sleep, users, and digital media technology.

I aim to interview 10 users, who have used *SleepTown* for more than 3 weeks, more than 4 times per week. You can still use the app or have already quit.

The interview content is about personal experiences of app use, perceptions about sleep and digital media technology, etc.

The interview will be conducted through online video call or audio call.

If you are interested in it or have any questions, you are welcome to leave a comment or contact me via private message.

I will treat you a cup of milktea if you have been interviewed successfully or recommend me interviewees.

Thanks a lot for your support (respect).

(image: the screenshot of my Town)