

## Concerns with Infrastructuring: Invisible and Invasive Forces of Digital Platforms in Hangzhou, China

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The techno-nationalist and surveillant aspects of Chinese platform infrastructuralization are well-documented, yet less explored are the responses of citizens and consumers to the fast-evolving digital infrastructures shaping daily lives. Instead of focusing on the economic and political landscape, we offer a perspective that shifts from structures to processes, aiming to bridge studies of platforms and infrastructures. Through a participatory research design, we explore how couples, families, and groups of friends in Hangzhou cope with platform infrastructures. By tracing moments, interactions, and relationships recognized as critical in terms of living with digital platforms, we highlight instances of infrastructural realization and triggered and unconcerned responses to platform power. Our analysis advocates the acknowledgment of the complex and generative nature of platform developments, involving not only corporate and regulatory interests but also the preoccupations of everyday users. Understanding how people in China react to the emerging platform infrastructures provides insights, which can be used as a starting point when speculating about futures where platforms are even more deeply woven into daily life, prompting collective deliberation and pushback.

*Keywords: platformization, platform infrastructuralization, infrastructuring, everyday life, China*

“There’s no replacement for WeChat and Alipay. You must choose one of them,” stated Kang Hu, a 35-year-old mobile game developer, explaining how one needs to decide between the two services to navigate daily life. A notable feature of our interviews with residents of Hangzhou, the capital of China’s eastern coastal province of Zhejiang, was that mobile-based services on the WeChat platform (微信, *weixin*)

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and the Alipay e-commerce platform (支付宝, *zhifubao*) were described as indispensable. Various scholars have argued that dominant platforms like Google and Amazon in Western nations and WeChat in China are developing into infrastructures on which people depend (Helmond, Nieborg, & van der Vlist, 2019; Nieborg & Helmond, 2019; Plantin, Lagoze, Edwards, & Sandvig, 2018; Vaidhyanathan, 2011). In China, this platform infrastructuralization has been particularly intense. WeChat now works as an infrastructure for sociality, content circulation, and monetary transactions (de Seta, 2020), suggesting that “leaving WeChat means leaving social life,” as Chen, Mao, and Qiu (2018) put it (p. 2). In Hangzhou, the original hometown of the tech giant Alibaba, Alipay has grown into a central everyday platform, as Alibaba and Ant Financial have cooperated with the local government to improve the city’s digital services with the aim of making Hangzhou the leading city in China’s digital economy (Chen & Zhu, 2022; Gao & Ru, 2021).

The rapid processes of Chinese platform infrastructuralization are strongly related to the central and local governments’ techno-nationalistic agenda, by which state and local authorities promote and govern technology companies and technological development, thus maintaining a close relationship between state authorities and platform companies (Chong, 2019; Plantin & de Seta, 2019; Z. Zhang, 2020). While research has tended to emphasize U.S.-based platforms over others (Davis & Xiao, 2021; L. Zhang, 2020), Chinese platform developments and the related configurations of state-company relations have been recognized as reference points for understanding platforms on a more general level (Davis & Xiao, 2021; Plantin & de Seta, 2019; Wang & Lobato, 2019; Z. Zhang, 2020; Zhou & DiSalvo, 2020). Whereas the techno-nationalist and surveillant aspects of digital platforms have been amply documented, we know much less about how Chinese citizens and consumers understand, recognize, and respond to the rapidly emerging infrastructures that increasingly shape their daily practices. In the present study, we add to the body of scholarship that seeks to understand the everyday perspective on digital systems and platforms in China (Chong, 2019; Shen, Faklaris, Jin, Dabbish, & Hong, 2020; Zhou & DiSalvo, 2020) and explore how couples, families, and groups of friends collectively negotiate and make sense of digital platform infrastructures in the context of their lives.

Our research approaches the powers at play from a perspective that focuses not on what digital developments do *to* people but rather on what people do *with* them (Pink, Ruckenstein, Lupton, & Berg, 2022). The goal is to demonstrate how infrastructural tendencies are negotiated, lived with, accepted, and rejected. In approaching the everyday tensions and balancing acts connected to digital developments, we build on research that focuses on the experiential, affective, and lived dimensions of data-intensive digital technology-related developments, highlighting the importance of understanding people’s practices, tactics, and sense of agency amid social and societal transformations (Bucher, 2017; Kennedy, 2018; Paasonen, 2017, 2021; Ruckenstein, 2023). Helen Kennedy (2018), for instance, insists that “we need to listen to the voices of ordinary people speaking about the conditions that they say would enable them to live better with data” (p. 28). The value of this kind of perspective is that it reveals otherwise-unnoticed and even neglected aspects of digital systems and points out developments that people are not concerned about even if they may have profound consequences in the everyday.

By engaging with the perspectives of Hangzhou residents, we seek answers to how they recognize the enmeshing of digital platforms in their daily lives and cope with the phenomenon. We rely on a methodological stance that draws on Star and Ruhleder’s pathbreaking research (Star, 1999; Star &

Ruhleder, 1996) on the relationality of infrastructures, which is widely used in science and technology studies but has received less attention in research focusing on platforms. By opening an exploratory space in which our Hangzhou interviewees can express what animates and concerns them or does not bother them, we pay attention to how people—knowingly or unknowingly, through voluntary or involuntary engagements—shape the emergence of platform infrastructures. Thus, we shift to examining infrastructuring (Karasti & Blomberg, 2018; Star & Bowker, 2006) rather than infrastructuralization and shed light on how platform power should not be treated as separate from the way people use, promote, doubt, and negotiate technologies. While we describe how our Chinese interviewees notice, reflect on, and evaluate processes around platforms, we focus on how they grapple with the omnipresent digital environment, which also points to the limits of the everyday understanding of these processes.

### **From Infrastructuralization to Infrastructuring**

Drawing on media studies and software studies research, Plantin and colleagues (2018) define platforms as programmable technical systems with stable cores and modular, complementary features that have the architectural potential to become ubiquitous. Thus, platforms provide opportunities for different actors to access technological and economic resources to provide applications for end users on standardized, easy-to-use interfaces. In these processes, the platform builder profits from buy-ins and lock-ins that involve both service providers and users (Plantin et al., 2018). Alongside these more technical descriptions of platforms, other scholars have highlighted their social and economic aspects. For instance, Srnicek (2017) defines five platform types—advertising, cloud, industrial, product, and lean platforms—to describe their revenue models and functions in the economy. Using a more discursive approach, Gillespie (2010) concludes that the term “platform” is sufficiently specific to mean something but also vague enough to work for multiple audiences.

What we find common to all these definitions is their emphasis on platform as an entry point to explain how digital services are becoming a critical part of people’s lives and even entire societies around the globe. We are confronted with network effects (Srnicek, 2017), suggesting that platforms rely on gaining more users to thrive. The cycle of users begetting more users leads to platforms having ever-increasing access to social activities that can be turned into data, strengthening the tendency of platforms to strive for monopolization (Srnicek, 2017). The foundational logic of platforms enables their providers to expand their functions to gain space in society, a process that van Dijck, Poell, and de Waal (2018), among others, have called platformization—the penetration of digital platforms into different economic sectors and the associated reorganization of cultural practices and imaginaries.

Some scholars have described platforms as digital infrastructures (Poell, Nieborg, & van Dijck, 2019; Srnicek, 2017; van Dijck, 2020; van Dijck et al., 2018), whereas others, drawing on infrastructure studies, do not see digital platforms as infrastructures per se but instead suggest that dominant platforms like Google, Facebook, and Amazon in Europe and the United States and WeChat in China are undergoing infrastructuralization (Plantin & de Seta, 2019; Plantin & Punathambekar, 2019; Plantin et al., 2018; Vaidhyanathan, 2011). As Plantin and colleagues (2018) note, a handful of technology companies have learned to exploit platform power “to gain footholds as the modern-day equivalents of the railroad, telephone, and electric utility monopolies of the late 19th and the 20th centuries” (pp. 306–

307). Therefore, the authors suggest that platform studies would benefit from drawing on the concepts and insights of infrastructure studies. Bringing together these two perspectives offers an analytical lens to understand contemporary social life, of which any number of digital services are becoming a fundamental part.

Like the notion of platform, the concept of infrastructure remains contested across research fields; indeed, concerns have been raised about its analytical value (Hesmondhalgh, 2021). Yet, the shared aim of describing systems and processes like transportation, government services, banking and finance, electricity, and information and communication systems, which function to produce and distribute a continuous flow of everyday goods and services (Mattern, 2018), is increasingly important in the context of the ongoing and seemingly inexorable expansion of the digital world. We add to this attempt to bridge studies of platforms and infrastructures with a perspective that emphasizes the processual nature of infrastructures. In the everyday, infrastructures are often viewed as substrate systems, but this approach is clearly insufficient for researching their social and experiential aspects (Star & Ruhleder, 1996). Larkin (2013) suggests examining infrastructures through the relationships they enable; that is, not only as material things but also as relationships among different entities. Beyond their physical characteristics, infrastructures “exist as forms separate from their purely technical functioning, and they need to be analyzed as concrete semiotic and aesthetic vehicles oriented to addressees” (Larkin, 2013, p. 329). Thus, from the relational and processual perspective, the question is when and how—rather than whether and for all time—something is an infrastructure (Star & Ruhleder, 1996). While infrastructures are understood as complex entities that mean different things in different contexts, conceptualizing an infrastructure turns into a methodological question; defining an infrastructure is an act of deciding what counts and what does not (Jensen, 2007; Larkin, 2013).

Turning to the everyday, we follow Star and Ruhleder (1996) in appreciating the situational and contextual nature of infrastructures. In studying information system infrastructure in the 1990s, these authors proposed that an infrastructure can be both ecological and relational (Star, 1999; Star & Ruhleder, 1996). This means that to become infrastructural, technology needs to align with people’s practices; infrastructure comes into being in relation to the actions, tools, and built environment when local social practices are afforded by larger-scale technology that then becomes a natural part of those practices. Star and Ruhleder (1996) describe the process by which something that reaches an infrastructural position sinks into other structures, technologies, and practices, becoming a taken-for-granted part of wider social conventions. Infrastructures’ systemic qualities remain partly invisible, and the fundamental role of a given infrastructure is typically fully revealed only on breakdowns.

Highlighting the social nature of infrastructures, Star and Ruhleder (1996) argue that research should treat them as working relationships rather than static systems; because infrastructures come into being through people engaging with them, their existence depends on the social practices bound to them. As we focus on the relational aspects, our attention shifts from platform infrastructuralization to infrastructuring (Karasti & Blomberg, 2018; Star & Bowker, 2006). The former highlights the general power shifts, emphasizing economic and political changes that emerging platform economies have promoted in society, while infrastructuring zooms in from structures to processes. Tracing the moments, interactions, and relationships that people recognize as critical in terms of living with digital platforms becomes a starting

point for interrogating platforms and their infrastructural qualities. Thus, our approach complements existing studies; instead of concentrating on the general economic and political landscape, we pay attention to how these changes occur in specific contexts when people adapt to the digital developments around them, and their actions become a crucial part of emerging infrastructures.

### **Exploring Responses to Platform Infrastructures in Hangzhou**

The location of our research, Hangzhou, is the capital of the coastal Chinese province of Zhejiang with more than 10 million residents. We chose Hangzhou because it serves as an exemplar for urban digital development in the rest of China. Over the past decade, Hangzhou has focused policy initiatives on developing its digital economy as its core competency. In 2010, China's central government designated Hangzhou as one of five trial cities for cloud computing and invested in Alibaba to develop e-commerce in the city (Gao & Ru, 2021). In 2014, the Hangzhou municipal government took the lead in implementing the "No.1 Project" for artificial intelligence applications in the information economy in China, treating the digital economy as the city's "first priority." In 2018, Hangzhou announced its intention to become the leading city in the Chinese digital economy (The Information Office of Hangzhou Municipal People's Government, 2018).

Beyond the government commitment and support, Hangzhou is the original home of the tech giant Alibaba, whose headquarters and research and development center are still located in the city. Initially an e-commerce platform company, Alibaba and its subsidiaries' services have now spread across all areas of commerce, finance, logistics, and cloud computing. In the last decade, Alibaba has aligned its corporate strategies with Hangzhou's urban development plans (Chen & Zhu, 2022; Gao & Ru, 2021). The epitome of this effort is the City Brain, a vision of a comprehensive digital platform and future-oriented infrastructure for urban development, management, and governance developed through a cooperative effort by Alibaba, the Hangzhou city government, and other stakeholders. The City Brain aims to cover all aspects of urban life, including transportation, health care, taxation, education, and tourism by continuously integrating the data and functions of all kinds of platforms (Caprotti & Liu, 2020). Thus, zooming in on Hangzhou residents' digital lives offers the opportunity to explore how platforms are not only affecting but also reshaping experiences in an infrastructural way as China implements a top-down initiative to increase the digitalization of society.

In the present study, we discuss findings from semi-structured interviews with families, couples, and groups of friends. The analyzed data consist of six group discussions with a total of 17 participants (see Table 1). The interviews were conducted and audio-recorded in Chinese between January and July 2021 by the second author as part of a broader research project that began in October 2020; she later transcribed and translated them into English. Before the interviews, we sought a statement from our university's institutional ethical review board and have taken careful measures to protect the privacy of our interviewees. We allowed participants to choose their own pseudonyms and have used them throughout the project: Some chose one with a surname and first name, while others preferred only a first name. Before each interview, we provided written information about our study, and the participants signed an informed consent form.

**Table 1. Research Participants.**

	Participants	Relationships
Interview 1	Afu, M, 40, engineer in the renewable energy sector Rong, F, 39, business manager in a trading company	A couple living together with their two children and Afu's parents
Interview 2	Ying He, F, 27, product consultant in the information sector Lu Yang, F, 26, human resources manager in the online education sector Xing Jin, F, 27, human resources manager in the cosmetic medicine industry Hang, M, 27, geomatics engineer Tian Wen, M, 27, information technology engineer	A group of friends, newcomers to Hangzhou
Interview 3	Kun Yu, M, 32, hydraulic engineer Ya, F, 31, electrical engineer Susu, M, 35, engineer in the renewable energy sector	A couple and their friend
Interview 4	Kang Hu, M, 35, mobile game developer Qing Xiao, F, 35, information management engineer	A couple with one child
Interview 5	Ping, F, 53, manager at a state-owned insurance company Ze, M, 53, manager at a construction company Hui, F, 27, business manager at a renewable energy company	A couple and their adult daughter living together
Interview 6	Jian Jun, M, 57, educational researcher He Guifei, F, 58, retired middle-school teacher	A couple

Before conducting the group interviews, we had carried out a preliminary round of individual interviews in 2020 to obtain an overview of the digital landscape by mapping the most important services in Hangzhou's daily life. The group interview participants were recruited by inviting informants whom we had already interviewed individually, and they could bring along their friends and family members, to react to and discuss the themes that had emerged in the earlier data gathering. Additional interviewees were later found through snowball sampling. We used this recruitment strategy to identify interviewees who would be comfortable talking about technology-related issues to researchers in a European-based project. This of course limits the generalizability of our findings as we mainly focused on the experiences of Chinese professionals in technology-related sectors. Yet, the limitation was also a strength of this study because we could ensure that our interviewees were ready to thoroughly discuss and even debate questions concerning digital platforms and infrastructures. Thus, by including opinions from techno-experts as mundane users, we could ensure a more robust deliberative process.

The group interviews explored further the findings from the initial mapping phase, identifying WeChat and Alipay as the most important digital services of Hangzhou residents. Considering earlier research (Chen et al., 2018; de Seta, 2020; Shen et al., 2020), this finding was not surprising in itself, but the way the interviewees evaluated and discussed these services as part of their lives called for additional inquiry. In the analysis of group interviews, we wanted to highlight Hangzhou residents' experiences of, understanding of, and opinions about platforms. Our aim was not to unravel all the different relationships our informants had with prominent platforms but to focus on recurring concerns with infrastructuring and platforms as part of daily life.

To stimulate the discussions, we presented claims about platforms that had emerged in the interviews in the preliminary mapping phase, such as, "One of the interviewees argued that 'we rely on WeChat too much. It has integrated so many functions that if one day you must stop using WeChat, part of your life will be vacuumed up.' What are your thoughts about this claim?" and "Alipay appears to be an integral part of local life in Hangzhou. How essential it is for you?" The claims were intended to be invitations to engage in a multivocal conversation that served as a participatory space in which we could work collaboratively with our informants to deepen the understanding of everyday tensions and balancing acts related to digitalized lives. The interview guide left ample room for interviewees to debate the topics and for the second author to moderate the discussions and ask follow-up questions.

In general, group interviews provide rich evidence of how participants evaluate and discuss the topics and themes of interest as they provide an audience for one another. This encourages people to offer more detailed descriptions of their views and to relate them to the views of others (Kitzinger, 1995). Studies emphasize how group interviews afford a perspective that focuses not only on what is said but also on the collective deliberation and speculation that flows and develops among participants (Grønkvær, Curtis, De Crespigny, & Delmar, 2011; Halkier, 2010). In their research on behavior-based insurance, Tanninen, Lehtonen, and Ruckenstein (2022) used group interviews to create an interaction space for participants to collectively test ideas concerning self-tracking technologies and autonomous agency and to envision desirable future scenarios. Relatedly, we aimed to generate interaction situations in which Chinese participants could discuss digital services and infrastructures, weigh their daily impacts, and evaluate and speculate on their present and future digital everyday lives.

In the analysis, we focused on the portions of the interviews that explicitly dealt with informants becoming aware of the effects of platform infrastructures. As the participants shared their views, they helped one another to identify platform relationships that they might not have recognized on their own. We paid attention to how they collectively not only recognized the agency of some platforms but also ignored other infrastructural platform relationships. Special attention was given to those passages in the interviews where the interaction was somehow intensified, as when participants became excited about discussing the claims and topics presented or even began arguing with one another. Following Tanninen and colleagues (2022), we see these momentary intensifications as indicators of shared interests; during those moments, participants often reasoned collectively about the tensions caused by platforms. We tracked the intensity of the discussions and analyzed passages by posing the following questions: What was the interaction like, and did the participants agree or disagree about the matter at hand? How did the discussion evolve, and did the participants recognize new platform effects through collective negotiation?

With these questions, we detected three themes in the ways our informants responded to everyday platform infrastructures. First, they tended to discuss platforms by explaining moments in which they became aware of infrastructuring. This meant sharing stories about how a platform had become an integral part of everyday practice. Second, we detected an unconcerned way of talking about platform infrastructures, which highlighted the neutrality of infrastructures: The informants only acknowledged the importance of a platform in their everyday lives after cooperative speculation. Finally, we detected a triggered way of discussing infrastructures, where the interviewees shared their irritation concerning the platform power they felt at work and in their social circles.

### **Momentary Realizations of Infrastructuring**

To understand how our informants felt about platforms as part of their lives, we asked about changes they had noticed in relation to digital services and whether they thought those changes had happened gradually or if they had noticed more dramatic shifts. In their answers, the participants discussed how WeChat and Alipay had crept into their daily lives as a necessity. This had happened “little by little” or with “slow” acceptance, as some interviewees put it, showing how platforms build on prevailing social practices and conventions to gradually become embedded in them. However, our informants also pointed out occasions when they suddenly realized that a digital platform had become entangled with their everyday lives and practices. These moments worked as conversation openers concerning processes of infrastructuring and its effects as they made participants aware of the growing importance of digital platforms and their own roles as part of this change. It was not only that platforms influenced their lives, but their lives with others also affected the platforms.

For instance, a recognized change was triggered by WeChat’s red packet function. In interview 3, Kun Yu stated how he had “hardly noticed” the changes and even found them “inexplicable,” to which his wife Ya replied, “Well, not inexplicable but gradual.” Ya continued by saying that she remembered Chinese New Year in 2015, or perhaps 2016, when people started using WeChat to give digital red packets (红包, *hongbao*). It is not a coincidence that WeChat red-packet gift-giving was associated with the penetration of digital services into everyday monetary transactions. Xu (2021) argues that the introduction of the red-packet function was Tencent’s starting point to successfully expand the WeChat platform to cover a variety of financial functions. With red packets, WeChat succeeded in its infrastructural efforts by becoming an integral part of the reciprocity that defines Chinese sociality. The red packet, also called “red envelope” or “lucky money,” is an age-old New Year tradition with many cultural beliefs and norms that guide the reciprocal interactions of giving and receiving (Siu, 2001). Traditionally, older people give red packets to younger ones as these packets are believed to ward off evil spirits. Today, red packets represent best wishes and good fortune and are given in digital or physical form to relatives, friends, and even coworkers during Chinese New Year, on other celebratory holidays, and for notable events like weddings. Ya treated WeChat’s red packet as a “milestone”: That “was the time when I felt that online and offline worlds were connected,” she explained, pointing out how she noted WeChat’s infrastructural efforts.

The interviewees also pinpointed other key events. Noticeable infrastructural changes were related to situations where long-standing social practices had shifted into online venues, such as annual shopping sales or the Buddhist temple seeking donations from visitors only through mobile payments. Some of these experiences highlighted how critical digital services had become. For instance, Kang Hu (interview 4) described realizing the vital role that Alipay had come to play in Hangzhou when he visited a gas station at night “just in time for the three-to-five AM Alipay credit system maintenance break.” Since he had no cash, he could not fuel up. Luckily, more than an hour later, another customer came and paid for his gas, and Kang Hu transferred the money to him digitally through another mobile service.

The recognized changes triggered further reflections on digital platforms gaining a foothold in Hangzhou’s everyday life. For example, Kun Yu (interview 3) noted that beyond Alipay handling almost all everyday payments like utility bills, his retirement plan and medical and social insurance were connected to



it. He concluded that Alipay “is indeed a monopoly.” Ya agreed with her husband, stating that although Alipay was not personally important to her, its power was undeniable. She continued with an example of how Hangzhou residents no longer needed to carry a physical social insurance card; they could simply show their Alipay digital insurance card.

These examples underline the relational nature of infrastructures while giving concrete form to how it feels to live amid a digital monopoly. The ubiquitous nature of the platform and the experiences it triggers are a direct consequence of current policy aims that have positioned Hangzhou as the test bed to launch new mobile payment functions and related services, often in collaboration with regional or state authorities. In the everyday, the broader political-economic context melts away as people observe changes in the context of their lives. What became visible for our informants from the state and tech companies’ infrastructural efforts was the enmeshing of the online and offline, revealed in moments when they understood that a mundane tradition or practice was now carried out with the aid of a digital service. While participants might not have been aware of how they were participating in the systematic state- and company-led platform infrastructuring, the stories that recognize the key role played by digital services reveal how they became at least momentarily aware of their and other people’s role in that infrastructuring.

### **Unconcerned About Infrastructuring**

Alipay’s Zhima Credit (芝麻信用, *Zhima xinyong*) was one of the services that our informants frequently used in their daily lives. Zhima Credit, also called Sesame Credit, is the Ant Group’s credit-scoring and loyalty program, which researchers have characterized as one of China’s social credit systems (Chong, 2019; Kostka, 2019; Wong & Dobson, 2019). Despite frequent media accounts that create the impression of a single all-encompassing system, the actual Chinese situation is more complex, with various public and private social credit systems already in place and others being tested to track and assess the behavior and trustworthiness of citizens, businesses, social organizations, and state agencies (Kostka, 2019; Wong & Dobson, 2019). Zhima Credit generates a score from 350 to 950 based on five factors: Credit history, behaviors and preferences, fulfillment capacity, identity characteristics, and social relationships (Chong, 2019). Having a high Zhima score offers several benefits, from deposit waivers for car rentals and hotel bookings to the possibility of applying for foreign visas to Japan, Singapore, and European countries without the need for additional documentation. Supported by Alipay’s close connection to the state, the data for scoring are collected from administrative sources, such as the Public Security Ministry, the Taxation Office, and official financial institutes—and of course from services developed by Alibaba, such as the online shopping platform Taobao. Precisely how individual scores are calculated remains a corporate secret (Chong, 2019).

In Chong’s (2019) research on Zhima users in Beijing, most interviewees did not know what Zhima Credit did, nor did they find the system concerning. Similarly, our educated participants with relatively high incomes—and high credit scores—did not think that Zhima had affected their lives. Rong (interview 1) thought that “the credit score on Alipay is not that comprehensive” because it “only covers the economic aspects” despite the fact that Alipay has publicly acknowledged using data from several state registries. After being told what Zhima was, He Guifei (interview 6), a retired teacher, responded, “Then I must have used it; I just didn’t notice.” When asked whether he thought that Zhima Credit was important to current and future life in Hangzhou, Kun Yu (interview 3), who has “a quite high Zhima score of 810 or more,”

concluded that “it’s only a stunt.” Kun Yu uses Zhima Credit to rent deposit-free power banks, bicycles, and cars, but because of his high score, this has become an everyday convenience that he scarcely considers.

For most of our participants, Zhima appeared to blend so seamlessly into their daily life that they took it for granted. This neutrality reminds us of how infrastructures become rooted and normalized through routine use and disappear as they mesh with our daily actions (Paasonen, 2017). However, some participants did grasp the infrastructural qualities of Zhima. For instance, Susu (interview 3) first stated that Zhima is “just like a credit card,” and then continued by deliberating its consequences: “In the end, when everyone is using Zhima Credit to rent things without a deposit, it will become inconvenient if you don’t have one.”

Other participants considered Zhima’s infrastructural underpinnings by comparing and speculating about how Zhima worked for those with a lower score. Afu, an engineer who compared his experiences with those of his mother, who was living on a lower income in the countryside, pointed out that digital services affected people differently depending on their socioeconomic status. When his wife, Rong (interview 1), stated that Zhima was not important, Afu responded, “You just don’t feel it because our credit scores are high enough.” In the session with the group of friends, Ying He (interview 2) brought up her problems with Zhima. “I need to rent cars often, but I have a default record in my Zhima Credit due to previous renting issues,” summarizing her experiences as follows: “Zhima Credit is related to so many things. Alipay is connected to so many services. You can do a lot of things without a deposit, but one default in your record, no deposit-free service.”

### **Triggered by Infrastructuring**

Unlike Zhima Credit, WeChat raised immediate concerns about how it seeps into all areas of life. Our informants were profoundly aware that WeChat had become a prominent infrastructure for everyday sociality (Chen et al., 2018; de Seta, 2020) and expressed negative feelings because their work-life communication and social circles were all entangled on the same platform. Even though they were happy with the overall convenience that digital services provide, they expressed irritation at the need to be constantly reachable. The conversations on these topics quickly reached a collective agreement that WeChat has an invasive power over people’s lives as it binds together different social circles, from colleagues to children’s teachers and other parents, which our informants preferred to keep out of the platform.

The shared complaints resonate with research that describes how intensifying media use increases struggles with keeping work and leisure separate (e.g., Bagger, 2021; Gregg, 2011; Mazmanian, Orlikowski, & Yates, 2013; Villadsen, 2017). Four of the five interviewed friends (interview 2) stated that WeChat was a daily necessity for work. However, Hang, who works as an engineer, said that he mostly relied on phone calls. “He works in a more traditional industry” (传统行业, *chuantong hangye*), his friend Ying noted, and Hang agreed that this was why WeChat was “not indispensable” for him. Rong (interview 1), a business manager at a trading company, stated that she kept WeChat muted to avoid being disturbed by the flood of messages from colleagues and other contacts. In contrast, her husband, Afu, an engineer working in the renewable energy industry, responded that he could never do that because he worked for an international company and had to be available to business partners around the world at all times. These and similar

conversations suggest that whether a platform has acquired an infrastructural role in work life depends on the expectations and communication practices at a given workplace, highlighting the active role played by organizations and people in the infrastructuring of WeChat.

The ambivalence toward WeChat sparked lively discussions that considered how engagements with the platform strengthened its role as the main digital infrastructure for social life. This in turn generated reflections on how such power affects people, leading to discussions about mundane ways to resist it. Ying He (interview 2), for instance, thought that "WeChat integrates all your relationships. Because everyone is using it, it will be difficult to cross over to another platform, or to create another platform with such a strong social function." However, in highlighting the social nature of infrastructuring, Rong (interview 1) speculated that the infrastructural role of WeChat could be dismantled through collective or institutional practices; "It's not individuals who could make a change. It depends on the whole community around you." She continued by giving an example: "Our whole company decided to move from WeChat to Dingding [social communication platform designed especially for work purposes], and then it worked. But for individuals like me, I can't make that happen."

To balance the negative feelings toward WeChat, some said that they had created two separate accounts, with one strictly reserved for work. Others expressed regret that they had not done that when WeChat was new: "Now it's impossible to separate because others will find out you are using two accounts, which will be embarrassing," Lu Yang (interview 2) concluded. Some informants also detailed tactics of "passive resistance" to highlight the constant struggle with WeChat; for example, Ya (interview 3) recounted that when her leader asks everyone in a group chat to read a file and respond—which she finds very annoying—she is always "the last one to reply." Feelings of irritation about digital systems have been cited as a source of user agency; irritation inspires ideas of how to resist annoying systems (Ruckenstein, 2023; Ytre-Arne & Moe, 2021). Through their negative feelings, our participants were able to elaborate on WeChat's prevalent position in their daily lives, and irritation worked as a source for devising practices to deal with the pressures associated with WeChat.

### **Obtrusive and Invisible Infrastructuring**

Our empirical examples highlight the relational qualities of infrastructures that materialize as changes and tensions in daily lives. As our interviews demonstrate, residents in Hangzhou can identify processes of infrastructuring and obtain glimpses of everyday platform relationships, but they generally do not connect their own experiences with the broader developments concerning platforms and their users, institutions, state authorities, and technology companies. The relationalities that are recognized are often somehow out of the ordinary or rub the wrong way. This means that people ignore many aspects of infrastructuring even if they might be crucial for or even harmful to their daily functioning.

Alongside existing research that explains how platforms are becoming infrastructures and focuses on the configurations behind infrastructuralization, our research draws attention to the mundane and lived aspects critical to platform infrastructuring. Since we examined how people speak about and debate platforms, our approach offers partial and incomplete vistas of the platform connections and infrastructural relationships. Relatedly, Zhou and DiSalvo (2020) argue that even if ordinary users are critical of emerging

infrastructures, they might not recognize the importance of their actions for the continuing success of platforms. Our informants did, however, respond to aspects of processes of infrastructuring that mattered to them, making them visible for observation.

Focusing on what concerns and motivates in relation to digital platform infrastructures effectively demonstrates which aspects of infrastructuring people can grasp and what remains unacknowledged. For instance, our respondents did not discuss how red packets were connected to WeChat's expansion into the area of monetary transactions (cf. Xu, 2021), but they were able to pinpoint their introduction as an important shift in terms of digital services penetrating their daily lives. Similarly, when discussing WeChat, the informants were aware of how their supervisors', colleagues', and their own actions contributed to WeChat becoming a work-enabling infrastructure. These notions indicate that, when the platform interrupts the flow of everyday life, its invasive power and all-encompassing nature become visible.

In group situations, our interviewees helped one another to identify and speculate about more systemic outcomes. For instance, when talking about Zhima Credit, if someone referred to Zhima affecting those with a lower credit score, the scoring system triggered speculation about infrastructural effects and the convenience it provides. Although in an ambivalent manner, our interviewees were able to imagine systemic outcomes beyond their own experiential scope, underlining the fact that in group interviews, the participants can drive one another to think about what is going on in society at large.

Overall, our research shows that the concept of infrastructure is useful as a heuristic tool that aids in understanding how people and societies come to depend on digital systems and platforms—and how those systems and platforms depend on people. In Hangzhou, platforms are attached to existing everyday infrastructures through social practices and policy aims—and as our interviewees explained, the shift has happened so gradually that it is impossible to define precisely when a platform becomes an infrastructure, except during momentary realizations. Earlier research focused on defining similarities and differences in the concepts of platform and infrastructure (Plantin & Punathambekar, 2019; Plantin et al., 2018) or defined platforms as infrastructures (Poell et al., 2019; Srnicek, 2017; van Dijck, 2020; van Dijck et al., 2018). However, in the experiential realm, the boundaries between the two become fuzzy, and infrastructures—and platforms—escape clear definitions. From a processual and relational perspective, the analytical depth of infrastructure lies in its messiness. As infrastructures are contingent and always in the making, the processes of how they come into being in everyday interactions should be at the heart of future research agenda.

### **Conclusions**

When a platform works well for everyday life, its infrastructural seamlessness and consequent invisibility raise the broader question of how digital systems with a capacity to stratify and marginalize can exist without being noticed more widely. China is often treated as an exceptional case, especially with the digital surveillance and social credit systems being described as a comprehensive, even Orwellian surveillance mechanism. Wong and Dobson (2019) argue that this kind of Chinese exceptionalism might distract us from the fact that similar scoring systems are spreading rapidly around the world. Comparing traditional credit-scoring systems, self-quantification practices, and the digital-

rating culture in apps such as Uber and Airbnb with the Chinese social credit systems, Wong and Dobson (2019) conclude that in Western countries, infrastructures are also used to stratify and classify and thus reward or punish individuals. The main difference is that in the West, these infrastructures are disconnected from one another, which might make them appear less harmful. Thus, looking in detail at the perceptions of digital developments in China can reveal more general trajectories of how systems with the potential to marginalize people and accelerate and deepen inequalities can become widely diffused without much resistance.

Listening to how residents of Hangzhou discuss the presence of infrastructural qualities of platforms in daily life confirms that scholars need to pay careful attention to the invasive forces of platform infrastructures. Through studies like ours, we can explore the broader ethical and political effects of digital platforms by paying careful attention to how they come into being when partaking in the daily flow of life. By turning to infrastructuring, we can move from more linear depictions of platform infrastructuralization to recognizing how they set into motion complex and complicit technological, social, and political dynamics. Instead of focusing on what platforms do to people and society, we shift the focus to responses to how platforms invade daily lives. However, this also means that the limits of everyday understanding of the operations of digital platforms are made starkly visible. People cannot get a grip on how broader systems and infrastructures of convenient digital infrastructures might stratify whole populations and marginalize certain groups. Here, research can also intervene in how everyday consciousness could and should be raised on issues related to platforms, especially their tendency to enmesh with daily life.

With the analysis that we offer, we advocate the acknowledgment of the complex and generative nature of platform developments, involving not only the various interests and aims of platform companies and regulatory bodies but also the preoccupations of ordinary users, to obtain a more comprehensive view of current developments. This can be achieved by looking at local platform processes or conducting comparative research by seeking similarities among different locations to determine more broadly shared and even parallel trajectories. Chinese digital developments have been intense and have outstripped the rest of the world in several areas, such as mobile payments. Therefore, understanding how people in China respond to the emerging platform infrastructures offers cutting-edge insights, which can be used as a starting point when speculating about a future in which such platforms are even more deeply embedded in the everyday and call for collective pushback.

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