

ORIGINAL CONTRIBUTION

Perspectives on Surrogacy in Chinese Social Media: A Content Analysis of Microblogs on Weibo

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Background: This article explores the social media discourse on transnational surrogacy and the issue of surrogacy more broadly considering recent news about the Chinese celebrity Zheng Shuang, which revealed that she had hired a surrogate mother in the United States and had later abandoned the surrogate babies. It aims to provide insight on how Chinese citizenry uses social media to express opinions on ethical and legal issues concerning surrogacy. **Methods:** We conducted a content analysis of microblogs from the social media platform Weibo posted within a month after the event was reported on January 17, 2021. The entire data set included 37,895 posts, which were analyzed for topic exploration using word frequency and keyword co-occurrence techniques, and a smaller sample of 1,000 posts was selected for an in-depth content analysis. **Results:** We established that the words “Zheng Shuang,” “surrogacy,” “babies,” “abandoning babies,” and “Zhang Heng” were most frequently used, with “law,” “ethics,” “justification,” “legality,” and “illegal” sharing high connections with these keywords. The qualitative content analysis further established that 399 microblogs (39.9%) expressed value judgements towards Zheng Shuang’s surrogacy, and 61.9% (n=247) opposed her surrogacy, while only 7.0% (n=28) were supportive. The major reason (n=72) against the celebrity’s surrogacy was that it was unfair and risky to surrogate children in this case. One hundred twenty-eight posts made value judgements towards surrogacy in principle, with 115 opposing surrogacy, and only two supportive posts. We also established that users with legal background had very limited presence in surrogacy discussions on Weibo, while users from healthcare professions did not engage at all in the social media debate. **Conclusion:** Opposition to surrogacy in Chinese social media discourse is primarily based on ethical and moral objections. The protection of surrogate children and surrogate women’s rights was the major concerns expressed by social media users, suggesting that this issue would likely be at the center of a future public debate regarding the regulation of surrogacy. We found the lack of healthcare professionals’ perspectives in social media discussions on Zheng’s Surrogacy disconcerting and suggest their inclusion in public deliberations to ensure that the public is better educated, and substantive concerns are properly addressed.

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Abbreviations: ART, Assisted reproductive technologies; CPLAC, Central Political and Legal Affairs Commission; DC, degree of centrality; LGBTQ, Lesbian, gay, bisexual, transgender, questioning.

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INTRODUCTION

In early January 2021, a new story surrounding a Chinese superstar, who conducted transnational surrogacy and intended to abandon the surrogating babies, received extensive media coverage in China and internationally. The celebrity that caused a heated debate on surrogacy was Zheng Shuang, a popular entertainment star with tens of millions of followers on social media. On January 18, 2021, Zhang Heng, ex-boyfriend of Zheng Shuang, published a post on Weibo, claimed that he was taking care of his two children in the United States. Subsequently, netizens on Weibo, the most popular social media platform in China, broke the news that the two babies are Zheng Shuang and Zhang Heng's children, and they were born in the US through surrogacy. According to an audio recording circulated online, Zheng Shuang was disappointed with the fact that a 7-month pregnancy could not be terminated. This recording was then interpreted by many as abandonment of the babies, which aroused anger and accusations that Zheng Shuang was an irresponsible person.

On January 19, 2021, Zheng Shuang responded on Weibo that she did not violate any of China's laws and respected local laws while residing abroad, which further fueled the controversy over her surrogacy case. That same day, the Central Political and Legal Affairs Commission (CPLAC) released the following statement:

"Surrogacy is explicitly prohibited in China. It uses women's uteruses as a tool and sells life as a commercial product and even abandons life. The hidden underground industry chain plays the edge ball of the law, which not only harms women's health and materializes and exploitation of women, but also tramples on citizens' rights and interests and damages human ethics. As surrogacy is banned in China, Zheng, a Chinese citizen, took advantage of legal loopholes by seeking surrogacy in the US. Her actions are definitely not law-abiding. As a public figure, she walked frantically on the edge of the law several times, putting such confused worldview, value and outlook on life under the eyes of the public and doing endless harm on public custom. This is by no means innocent!" [1].

The CPLAC is an institution directly under the control of the Central Committee of the Communist Party of China. Its main function is to guide the work of political and legal institutions at the central and local levels. Their main responsibilities include a range of activities such as: to grasp, analyze, study, and judge the situation of social security and the dynamics of political and legal work; to coordinate and promote the prevention and resolution of social contradictions and risks affecting social security; to coordinate and deal with major emergencies properly, etc. They are also involved in analyzing public, political, and legal opinion trends, and provide guidance and co-

ordination of the relevant political and legal institutions, publicize and report, guide public opinion, and other related work [2,3]. The CPLAC's opinion quickly gained attention on social media and was widely reposted and commented on by Weibo users. Zheng Shuang's supporters and opponents engaged in a heated debate on social media. Ethical, legal, and social aspects of surrogacy, including the use of assisted reproductive technologies more broadly were caught in the storm of public opinion [4].

This event provided an excellent opportunity to study the social media users' attitudes not only towards the celebrity's use of a surrogate mother abroad, but also their opinions on broader issues concerning the practice of surrogacy and its legalization in China. In this paper, we look at how users on Sina Weibo have engaged with the Zheng Shuang's story and access the nature of social media discourse on surrogacy more broadly. We collected all microblogs posted on Weibo within 1 month after the event was initially reported and examined key information from online discussion through word frequency and word co-occurrence network analysis. We further conducted a qualitative content analysis of a randomly selected sample of 1,000 microblogs to determine more nuanced views of Weibo users on key concerns related to surrogacy. Specifically, we focused on the following categories: 1) attitudes towards Zheng Shuang's actions (eg, approval, disapproval, or neutrality); 2) perceptions of ethical and legal issues relevant to surrogacy and transnational surrogacy; 3) users' responses to the CPLAC's comments on this event; and 4) expert opinion on the case. We contextualize the analysis with a discussion of societal factors that influence the adoption of assisted reproductive technologies (ART) and the practice of surrogacy in China. Finally, we conceptualize the impact of celebrities and social media on public deliberation regarding surrogacy and their potential to influence public policy decisions.

Overview of ART and Surrogacy in China

It is important to consider the broader context for the public debate stirred by the Chinese celebrity's surrogacy case and specifically the socio-cultural context around the adoption of emerging reproductive technologies in China. Over the past few decades, Chinese family values have been influenced by Western culture and modernization, and women are increasingly becoming involved in their careers and professional advancement, rather than focusing solely on their traditional family roles. According to the World Inequality Lab – Working Paper 2021/2022, the labor income of women in China accounted for 33% of the total population earnings, while the mean number in Asia is 26% [5]. However, Confucian family values,

which favor population growth, still play an important role in parenting. Childless families are facing some prejudice and are subjected to societal pressures to have children [6]. Couples who have infertility problems are willing to try every method to have babies [7]. The country's first baby via *in vitro* fertilization was born in 1988, making a milestone in China's fertility treatment [8]. However, the ethical and social challenges surrounding the use of ART have generated extended policy debates. In response to public concerns and fears about these new technologies, China's national health authority, the former Ministry of Health, developed a series of administrative measures to regulate and control the implementation of ART. According to these rules, all fertility treatment programs can only be carried out at government authorized hospitals [9,10]. As of December 31, 2020, 536 medical institutions have been approved by the national health authority to offer human ART procedures [11]. It should be noted that given the enormous demand (eg, over 10 million couples suffer from infertility in China), the currently available ART providers and services are in extremely short supply [12]. Moreover, with the recent change in the government's one-child policy, which now allows families to have up to three children, it is expected that the number of Chinese couples seeking ART would dramatically increase in the coming years [13].

Under the current Chinese law, ART services are only available to married couples with birth permission certificates [8], which prevent certain groups, eg, single women and members of the LGBTQ community from accessing fertility treatment. It is due to such restrictions that surrogacy has gained popularity and the demand for it has grown significantly since the birth of the country's first test-tube surrogate baby in 1996 [11]. The practice of surrogacy has raised legal and ethical debate in China, with concerns ranging from whether it is ethical to whether it should be legalized and how to regulate the surrogacy market. Scholars have argued that legislation should keep up with technological development and government should permit surrogacy legally with restrictions. For example, some believe that gestational surrogacy should be allowed because it is an effective method to solve female infertility and is ethically justified [10]. Some scholars, on the contrary, strongly object to the legalization of all kinds of surrogacy. They argue that the practice unnaturally deprives a surrogate mother from raising the surrogate child after giving birth, causing psychological harm to women that provide such services [14]. There are critiques of commercial surrogacy as a questionable practice that commodifies surrogate children and their mothers' uteruses [14]. Some scholars even urge the legislative body to criminalize the practice [13].

In 2001, the former Ministry of Health issued the regulation Management Measures for Human Assisted

Reproduction Technology (hereinafter Management Measures), which clearly stipulates that medical institutions and medical staff were not allowed to implement any forms of surrogacy. According to Article 22 of the Management Measures, medical institutions that were involved in illegal surrogacy would be warned and face up to a RMB 30,000 fine [9]. Later, in 2006, the former Ministry of Health issued another departmental rule, the Implementation Rules for Verification of Human Assisted Reproduction Technology and Human Sperm Bank, which indicates that if any approved ART medical institution carried out surrogacy business, its ART license would be revoked [10]. Nonetheless, these two departmental rules have had a limited effect on preventing surrogacy. The measures only punish medical institutions and medical personnel in China that violate the rules. The regulations do not impose administrative liabilities on other participants such as couples seeking surrogacy, surrogate mothers, and agents. Moreover, compared with the profit of surrogacy agencies, the punishment imposed on medical institutions and medical staff engaged in surrogacy business is weak. In general, punishment is difficult to be implemented in practice [15].

To date, at the national legislature level (ie, the National Congress and its Standing Committee), there has been no law established for regulating or making a general prohibition on surrogacy. Chinese agencies have been trying to address the legal issues surrounding surrogacy. However, no high-level or broadly binding laws have been enacted. In 2015, the State Council submitted a Draft of the Population and Family Planning Law of the People's Republic of China to the Standing Committee of the National People's Congress, in which clauses were drafted to prohibit the selling and buying of sperm, eggs, fertilized eggs, and embryos. Surrogacy in any form was also proposed to be banned [16]. In response, during the deliberation by the NPC Standing Committee, many members raised dissenting views, arguing that whether surrogacy should be banned or should be partially banned needs further study and discussions. Some members insisted that China should not ban surrogacy, law should be established to regulate surrogacy, rather than ban all kinds of surrogacy [17]. As a result of such disagreements, the prohibition on surrogacy was not included in the official version of the Amendment to the Population and Family Planning Law of the People's Republic of China, which was passed on December 27, 2015.

The lack of a general law explicitly prohibiting surrogacy, combined with the inefficient and ineffective supervision of the prohibiting departmental rules, has resulted in a booming market of underground surrogacy business in China. A study has shown that, before the Management Measures issued in 2001, about 2.1% of patients subjected to ART treatment turned to surrogacy at

the reproductive medicine center of Shandong University [18]. According to a report in 2012, there were 400-500 agencies running surrogacy services nationwide [19]. In a 2021 news investigation article, a surrogacy agency manager revealed that his agency has dozens of branches across the country and provides more than 100 services each year [20]. Facing a serious supply shortage, jurisdictions where commercial surrogacy is legal have attracted Chinese parents with financial capabilities to seek surrogacy services abroad.

Celebrity Surrogacy Births and their Impact on Public Debates and Relevant Legislation

In the past, several cases in China concerning surrogacy have attracted public attention and generated policy and ethical debates. For example, in a 2020 case, an intended father asked the surrogate mother to abort because she had hidden a syphilis infection. However, the surrogate mother did not follow the intended father's instruction and gave birth to the child [21]. While these stories were reported in some newspapers and on relevant websites, they did not generate a wide public debate on social media. By contrast, Zheng Shuang's transnational surrogacy drew extensive coverage not only from Chinese news media outlets, but many influential Western media outlets such as CNN, BBC, Independent, and The New York Times also reported the controversy [22-25]. It also sparked an extensive public debate on China's biggest social media platform, Weibo. According to the Weibo Influence Index, her case ranked in the top 1% on the entire social events list and was higher than 99% of all social events and 99% of all other entertainment events [4].

Past research in Western countries has shown that celebrities can have an impact on the general public's understanding and opinions about novel reproductive technologies and healthcare treatments [26]. However, the influence of celebrities on public attitudes towards emerging technologies in biomedicine has not been well addressed in the Chinese context. Zheng Shuang's case presents a unique opportunity to observe the social implications of celebrity culture in China and especially how social media users react to transnational surrogacy and surrogacy in general.

In the light of our study, it is also important to give proper consideration to the scholarly literature on the impact of social media on policy decisions in China. A number of studies have previously elucidated the processes of public opinion formation on social media channels which have the potential to contribute to policy development and social change [27-30]. While various social media worldwide enables users from diverse backgrounds to engage with ease in public discussions on social and legal issues by articulating their opinions, their importance

is particularly significant in the Chinese context, where online discussions of public affairs are accepted and even actively encouraged by state authorities in some cases [28]. The aggregation of online public opinions makes certain issues more prominent, which can push the online concerns of the public to the top of media and policy agenda [27,30]. Social media in China has been thriving in the past decade, with public opinions emerging from it often prompting state institutions to engage and respond to citizens' concerns, which can directly or indirectly influence decision-making and policy agenda [29,31]. The state officials' receptivity to citizen input has largely been dependent on the issue under consideration and their perceptions of antagonism expressed by social media users [32].

One example of the actual impact of social media is the case of Sun Zhigang in 2003. The incident, where a young man named Sun Zhigang was detained by a local authority on the suspicion that he was an illegal internal migrant and was announced dead due to heart problems a few days after the detention [33]. This triggered extensive online discussions and news media reports, in response to which the government ordered a thorough change in the custody and repatriation system in China [27]. In 2013, the Standing Committee of the Communist Party of China issued a plan for legislative work, aiming to seek public opinions of the draft laws and build a participatory legislation environment [30]. Such efforts, to some extent, facilitate the influence of social media discussion on the legislation process. The use of social media for legal or political purposes has been dynamic in its development. Empowered with advanced communication technologies, Chinese citizens have engaged in mobilizing political movement, such as rights defense movement [34], or participating in discussions about issues with legal controversies [35]. Moreover, online public opinion generated from social media has been depicted by Chinese citizens as omnipotent enough to impact the social system of China [27]. Therefore, there is a reasonable propensity for citizens to take advantage of social media, such as Sina Weibo, to potentially impact the legislation process in China.

In this regard, it will be important to study the lively social media debate in Zheng Shuang's case, especially if the online activism steers new legislative developments concerning surrogacy in China. It is worth noting that according to the "2020 Sina Weibo User Development Report," there were 511 million monthly active users and 224 million daily active users in September 2020, with about 78% of Weibo users born after 1990s and 2000s [36]. This speaks about the potential of social media channels to engage a large number of younger users in public debates on issues of common interest.

RESULTS

Most Cited Microblogs

We identified the top five microblogs based on the numbers of reposts and comments. They all were posted by media organizations. The topmost popular microblog was posted by Netease Entertainment Channel (reposted 191,059 times and received 253,540 comments). The microblog is a description of the story, including a transcript of selected leaked clips of Zheng Shuang and her parents' recording. Following the top-ranking post, there were three microblogs that condemned the surrogacy. Two microblogs were posted by CCTV News (an official Weibo ID of China Central Television) and one by ZiGuangGe (the official Weibo ID of the Banner Magazine published by the Working Committee of the Central and State Organizations). The three microblogs share the perspective that surrogacy is not compatible with both legal and moral standards, and that any forms of surrogacy are prohibited in China. The fifth-ranked microblog was posted by Sina Entertainment. Like the one posted by Netease Entertainment Channel, it only described the story without expressing specific positions on the issue of surrogacy.

Perceptual Co-occurrence Network Analysis

We computed the degree of centrality (DC) with UCINET 6.0 software (Borgatti, S.P., Everett, M.G. and Freeman, L.C. 2002. Ucinet for Windows: Software for Social Network Analysis. Harvard, MA: Analytic Technologies) and graphed the keyword co-occurrence network using Netdraw (Borgatti, S.P., 2002. NetDraw Software for Network Visualization. Analytic Technologies: Lexington, KY). We observed that "Zheng Shuang" (DC=23590), "surrogacy" (DC=20597), "babies" (DC=8192), "abandoning babies" (DC=8005) and "Zhang Heng" (DC=7879) were the most frequently mentioned terms. As shown in Figure 1, the core positions of these words in the network are represented by the five largest nodes. Since DC indicates the importance of a node in the network, our findings suggest that these five words express key areas of public concern in Zheng Shuang's surrogacy story. Moreover, the strength of the lines connecting keywords in the network reflects their correlations. Accordingly, the relationship among these perceived keywords indicates that most discussions, as we have observed, are on the controversy over Zhang Heng's disclosure of Zheng Shuang's seeking surrogacy and her attempts to abandon the surrogate babies. In addition, some perceived keywords at the network's outer range were also noted, such as "law," "ethics," "justification," "legality," and "illegal." These keywords share relatively low DC with fewer connections with the core

keywords, suggesting that the issues of legality and ethics are not the Weibo users' primary concern.

CONTENT ANALYSIS RESULTS

Attitudes Towards Zheng Shuang's Transnational Surrogacy

Within the randomly selected 1,000 microblogs, we have identified 399 microblogs (39.9%) that expressed specific attitudes towards Zheng Shuang's surrogacy story. Among them, 61.9% (n=247) opposed Zheng's surrogacy behavior, 31.1% (n=124) were neutral, and only 7.0% (n=28) are supportive. We classified the microblogs as neutral if the bloggers only expressed their surprise and aversion to the entertainment industry but did not make positive or negative judgements towards Zheng Shuang's transnational surrogacy. This neutral way of approaching the topic is exemplified with phrases such as: "This is really surprising," "I do not want to see that entertainment news," and "The entertainment circle is chaotic," etc. We also considered microblogs that expressed sympathy for Zheng Shuang's suffering but did not otherwise support her surrogacy behavior as neutral in tone.

In total, 104 (10.4%) microblog users explained specific reasons for opposing Zheng Shuang's surrogacy activity, with the most frequently cited being that surrogacy is unfair and risky to the children, accounting for 69.2% (n=72). Other common reasons against Zheng Shuang's surrogacy included arguments that surrogacy was morally unacceptable (n=51, 49.0%); that surrogacy was illegal, (n=18, 17.3%); and that it was morally wrong to bypass Chinese laws and go to the US for surrogacy (n=10, 9.6%). Six Weibo users explicitly supported Zheng Shuang, with five of them asserting that surrogacy in the US is legal.

Perspectives Towards the Issue of Surrogacy and Legislative Suggestions

There were 128 (12.8%) posts, in which users expressed attitudes towards surrogacy in principle. Of those, 115 Weibo users (89.8%) opposed surrogacy, 2 posts (1.6%) supported surrogacy, and 11 posts (8.6%) held a neutral position. In terms of microblogs that were against surrogacy, 23 Weibo posts provided specific arguments (see Table 1). The top three reasons were that surrogacy constitutes the commodification of women (mentioned by 14 posts, 10.9%); that surrogacy involves the exploitation of women (mentioned by 8 Weibo users, 6.3%); and that surrogacy objectifies human life (mentioned by 6 posts, 4.7%).

There were 11 social media users who addressed transnational surrogacy issues, emphasizing that it tends to be common among the powerful and privileged classes.

Table 1. Reasons Suggested by Social Media Users to Oppose Surrogacy

Reasons against surrogacy	Mentions (numerical and percentage)*
It contributes to the commodification of women.	14 (1.4%)
It involves the exploitation of women.	8 (0.8%)
It objectifies human life.	6 (0.6%)
It violates freedom.	5 (0.5%)
It infringes on human rights.	4 (0.4%)
It is likely to result in child abandonment.	2 (0.2%)
It is unnatural.	1 (0.1%)

*The percentage indicated in the bracket was calculated based on the 1,000 samples.

Moreover, none of the Weibo users mentioned commonly cited reasons for supporting surrogacy such as that it is beneficial to LGBTQ people, aging parents who have lost their only child, and infertile couples.

Within the 1,000 microblogs we analyzed, only 37 Weibo users discussed the legality of surrogacy and proposed legislative changes. All these microblogs were against surrogacy, objected against the legalization of this practice, and rejected the government's current plan to approve surrogacy arrangements in clinical treatments of infertility. Moreover, 17 microblogs (1.7%) argued that surrogacy should be criminalized in China.

User Expectations on how the Government should Treat Zheng Shuang

Sixty-eight Weibo users commented on how the government should respond to Zheng Shuang's case. Among these users, 31 posts (45.6%) insisted that Chinese government should punish the celebrity and that she should be banned from the entertainment industry. By contrast, 32 Weibo users (47.1%) argued that Zheng Shuang should not be subjected to such an extensive scrutiny by the news media. They argued that judging her surrogacy via media and in the court of public opinion is procedural injustice and unfair to the parties involved. Without a formal and thorough investigations, government media, such as the CCTV News, should not criticize the celebrity publicly and use their power in shaping public opinions to influence the public debate on her transnational surrogacy.

Discussions of the Underground Surrogacy Market and Law Enforcement

Only five Weibo users specifically referenced the underground surrogacy market. Two of them cited a news report by the renowned media organization Xinhua Net based on the investigation carried out by one of their journalists. This news article, entitled "In-depth investigation on the secret underground surrogacy market," describes how a reporter contacted a surrogacy agency by dialing a telephone number from an advertisement

and asked information about the price and conditions for conducting surrogacy, as well as the birth certificates of the surrogate children. The third post described the underground market as "human trafficking," "abducting women," "commodity-baby," "dark," and "forced." The remaining two posts did not give the source of information and the information presented could not be verified. We also established that only four laws were referenced, with one mention each. These include: 1) Management Measures for Human Assisted Reproductive Technology; 2) Notice on Revising the Technical Specifications, Basic Standards and Ethical Principles of Human Assisted Reproductive Technology and Human Sperm Banks; 3) Law of the People's Republic of China on Choice of Law for Foreign-related Civil Relationships; and 4) Adoption Law of the Civil Code. Users cited these laws to evaluate whether surrogacy in China is legal and to support their opinions towards surrogacy in China.

Comments by CPLAC

Forty-two microblogs included the hashtag "Central Political and Legal Affairs Commission Comment on Zheng Shuang's Abandon of Surrogacy." Thirteen posts expressed opinions about the CPLAC's commentary. Seven users agreed with the CPLAC, while six users disagreed. The following three reasons were provided for agreeing with the commentary: 1) that it is unethical to avoid Chinese laws and conduct the surrogacy in the US (n=40); 2) that surrogacy is a violation of human rights (n=3); and 3) that surrogacy leads to the commodification of women's bodies (n=2). Seven Weibo users disagreed with the comment released by the CPLAC, with six users arguing that the organization and other government media should not play the role of a trial judge, should not rush to judgment, and should not make biased comments without evidence and facts.

Professionals' Opinion

Our research identified microblogs posted by users with professional backgrounds, including legal experts,

lawyers, and sociologists, among other professions. These experts expressed their opinions about the Zheng Shuang's transnational surrogacy practice, the surrogacy market in China, and social justice issues stemming from the practice of surrogacy. For example, Luo Xiang, a popular criminal law professor with more than 2.5 million Weibo followers, argued in his post that "unrestricted freedom will definitely become the exploitation of the weak by the strong." Regardless of his status of an influential opinion leader, however, his post was only mentioned by four users. One lawyer, Zhou Zhaocheng, wrote in his microblog that surrogacy is illegal in China, but the rights and interests of the surrogate children are fully protected by Chinese law. Interestingly, we did not identify microblogs posted by users within the medical profession.

DISCUSSION

Our analysis indicates that the Zheng Shuang's surrogacy story triggered extensive public attention and lively debate on the Weibo platform. As discussed in the introduction, this is not the first time that surrogacy has been subjected to public scrutiny in China. Chinese news media outlets have previously reported cases related to surrogacy. However, previous news reports have never generated heated public debates on social media. Past research on celebrities and their impact on health-related attitudes and behaviors has shown that celebrity status is an important factor in generating public attention and media attention [41], as well as social media discussions about emerging biomedical technologies and innovative treatments [42]. For instance, in 2014, the famous hockey player Gordie Howe was in the news for receiving experimental stem cell treatments in Mexico. The Canadian hockey legend's story attracted heated discourse on Twitter about the efficacy and safety of novel and often unproven stem cell therapies for treating strokes [38]. In our study, we also established that the celebrity status had an impact on raising a public debate on the practice of surrogacy. As demonstrated from the large dataset, in just over a 1-month period (January 17 to 16 February 2021) nearly 38,000 microblogs were posted about Zheng Shuang's surrogacy practice. This finding again indicates how a celebrity's involvement can increase citizens' participation in debates on public health and bioethics issues.

Our study shows that the majority of participants in the social media discussions on Zheng Shuang's surrogacy case did not express specific attitudes or moral judgments towards surrogacy in general. However, for users who opposed surrogacy in principle, moral concerns, such as the practice of contributing to the commodification and of exploitation of women, were the main reasons to argue against surrogacy. When evaluating Zheng

Shuang's surrogacy behavior, the most frequently cited reason to criticize her transnational surrogacy was the negative impact the practice can have on children conceived through surrogacy arrangements. The users argued that her decision to abandon the two surrogate babies was unfair and harmful to the children. Some broader concerns about the practice of using surrogate mothers were frequently expressed when users commented on the celebrity's surrogacy. In particular, some posts expressed concern that conducting surrogacy was morally unacceptable in principle and that bypassing Chinese law to travel to the US for conducting surrogacy was unethical. These public attitudes suggest that efforts to legalizing surrogacy in China may face potential societal challenges and, potentially, some opposition from members of the public based on moral grounds.

Another important finding is that for Weibo users holding negative attitudes towards surrogacy, legal considerations, such as the fact that surrogacy is not legally permitted in China, did not seem to matter. This reveals the general public's misunderstanding about the legal status of this practice in China, especially from a non-medical perspective. Under the current law, surrogacy arrangements are not in general prohibited by law [43]. Participants in surrogacy practices, other than medical institutes and medical professionals, have fallen outside the supervisory scope of applicable departmental rules. As a result, there is currently an unregulated underground surrogacy market in China that has become a booming industry [44]. Its existence confuses the general public regarding the legal status of surrogacy and the potential risks when seeking such services. The scholarly literature on the issue has emphasized that the current regulatory regime cannot provide comprehensive protection to all subjects involved in the surrogacy practice [19,45,46]. For example, the rights and interests of surrogate children, which has also been the main concern in Zheng Shuang's case, are not well protected under the current Chinese law. As there is no general Chinese law prohibiting surrogacy, the legality and other relevant legal issues of surrogacy are decided by courts. In the judicial practice, when dealing with paternity disputes in surrogacy cases, courts have different interpretations of the former Ministry of Health's departmental rules. The courts conduct their own ethical evaluations and apply general rules to make decisions related to surrogacy. Past research has shown that in domestic surrogacy cases courts are inclined to invalidate surrogacy agreements because the practice itself is against public order and good customs [19].

Our study has also provided insights into the users' views on transnational surrogacy, as Zheng Shuang and her husband carried out their surrogacy arrangement in the US. From the microblogs that disagreed with Zheng

Shuang's behavior, ten users argued that transnational surrogacy should not be allowed and people should not take advantage of legal loopholes and conduct surrogacy in other countries, where the practice is legal. Moreover, transnational surrogacy has been criticized for serving only rich and privileged people. Indeed, the cost of transnational surrogacy is substantial. A recent investigation has revealed that transnational surrogacies in the US and Canada cost between USD \$90,000 and \$150,000, which is not affordable for the majority of people in China [47]. The Weibo users' negative reaction to transnational surrogacy reflects more overarching concerns about the inequality in reproductive rights and access to treatments.

On other internet platforms, people who are supportive or neutral to surrogacy have also discussed the greater demand for surrogacy services from minorities and other vulnerable groups. These groups include the LGBTQ community, families who have lost their only child in their 50s or 60s, or infertile couples who could not get pregnant through ART [43,48]. Indeed, surrogacy may be the only choice for these people, who cannot have a child by other means. Taking the LGBTQ community as an example, a recent study shows that LGBTQ people face significant social and family pressures since China is a traditional, family-oriented society. They are forced to seek alternative ways to become parents, including surrogacy services. However, the social media posts included in the analysis did not mention the needs of such vulnerable groups when discussing key issues in Zheng Shuang's surrogacy practice. The in-depth content analysis showed that there was not even a single microblog that took the case of vulnerable groups as a supportive argument for the legalization of surrogacy. Rather, the 10 microblogs in our dataset that mentioned gay people were all negative, condemning the surrogacy choice of homosexual celebrities. This finding clearly illustrates the social stigma surrounding the LGBTQ community in China, especially when gay couples are choosing to become parents. A study published in 2020 on Chinese gay men in clinical counseling has also shown that members of this group suffer from stress-related conditions because of the homophobia deeply rooted in Chinese family tradition. According to this study, having a child via a sham marriage or surrogacy sometimes may even exacerbate tensions between gay couples and their family members [49].

In terms of the impact of Zheng Shuang's case on surrogacy regulation, the intense public debate may have put additional pressure on the legislators. It is not coincidental that on March 3, 2021, a few weeks after the first report on Zheng Shuang's surrogacy, the official account of CPLAC, China Chang'an network, issued an online survey on Weibo. In this online survey, Jiang Shengnan, deputy to the National People's Congress, suggested that

practitioners of illegal surrogacy should be punished and the legal blank in surrogacy should be filled as soon as possible. Zhu Lieyu, another deputy to the National People's Congress, proposed that surrogacy should be legalized with conditions and illegal surrogacy market should be cracked down. A total of 2,256 people participated in the voting, with 1,910 people (84.7%) supporting Jiang Shengnan's proposal and 272 people (12.1%) voting in favor of Zhu Lieyu's proposal; other views were expressed by 74 respondents, accounting for 3.3% of the survey participants [50]. The survey is an indicator that the CPLAC was actively seeking public opinions on surrogacy legislation, rather than just denying the possibility for the legalization of surrogacy due to the Zheng Shuang's case.

Finally, we found out that opinions from users with professional backgrounds had a very limited presence on Weibo and did not inform the public debate on the ethical and legal issues of domestic and transnational surrogacy. In fact, only nine microblogs mentioned perspectives by professionals such as lawyers and legal scholars, however, there was no expert opinion from the medical profession in these posts. Although previous studies have indicated that Chinese doctors often engage in health communication on Weibo by refuting rumors around medical myths and by sharing information with their followers on medical and public health concerns [51], their participation in Weibo discussions about Zheng Shuang's story was missing. One possible reason is that it is illegal for physicians to carry out surrogacy in China. Nonetheless, we argue that the involvement of health professionals in the public engagement process is important because of their ability to advance the public's medical education. Their expertise can also improve decision-making regarding surrogacy, which would in a long run benefit prospective parents. In this regard, strategies should be developed to promote physicians' engagement in public debates on surrogacy and ART in general [52].

We acknowledge limitations in our study stemming from the demographic of Weibo users, eg, predominantly younger generations, that may have skewed the results to a certain extent, rendering the analysis not fully representative of the opinions of all Chinese citizens. In addition, the study does not allow to draw generalizable conclusions about the ethical perspectives of Chinese citizenry towards the practice of surrogacy in principle as our analysis has shown that most participants in the social media discussions focused exclusively on the celebrity's surrogacy, and did not engage in consideration of the moral permissibility of the practice or other relevant ethical issues. This limited scope of our qualitative analysis of the microblogs stems from the polarizing nature of public discussions on social media, where users tend to express strong and, sometimes, ambiguous opinions. The mes-

saging format is another reason for the lack of more substantive debate, as it does not allow lengthy discussions and often precludes users from providing clarifications about their value judgements or evidence-based justifications of their positions. Nonetheless, this ambiguity in using terms such as “protection,” “harmful” and “moral reasons” prevent us from inferring strong conclusions about the extent of public opposition should surrogacy become legalized in China.

CONCLUSION

Our study has demonstrated how Zheng Shuang, one of the most influential celebrities in China, has generated a wide and heated online public debate on transnational surrogacy and the practice of surrogacy in principle. We established that the most influential opinions on Zheng Shuang’s case were expressed by government news media organizations. Although more than 50% of the posts we analyzed only disseminated the news story on the social media platform, around 40% of Weibo users expressed their attitudes towards the superstar’s transnational surrogacy. For those who expressed their opinions, around 60% were negative about her surrogacy decision, and only 7% were supportive of her choices. We found out that ethical and moral concerns, such as that surrogacy is unfair and risky to surrogate children and that surrogacy is morally unacceptable, were the main critical arguments raised by the Weibo users. Based on these findings, we hypothesize that the future debate on the legalization of surrogacy in China may unfold around moral and ethical objections to the practice. One important issue is the protection of the rights and interests of surrogate children and surrogate women, which was the main concern expressed by the public in discussing issues related to regulating surrogacy. In this regard, discussions on the regulation of surrogacy and, in particular, whether a general ban on surrogacy should be enforced would benefit from a more rational and evidence-informed discourse, rather than personal bias and quick moral judgements [53]. In addition, if surrogacy is to be permitted under certain conditions, measures to protect the surrogate children’s rights and interests are of paramount importance that should be taken into consideration by the legislature.

The content analysis indicates that transnational surrogacy has not been viewed favorably by Weibo users. The high price for implementing surrogacy in foreign countries is the reason opponents believe that such services are only available for the rich and privileged people. There is an additional concern about reproductive rights and inequality in transnational surrogacy. Moreover, our study has shown that arguments that are commonly used by proponents of surrogacy in policy debates and the scholarly literature were rarely stated in the microblogs

in our dataset that were supportive of the implementation of surrogacy. For example, the demands for having genetically related children by members of the LGBTQ community and by aging couples who had lost their only child have not been mentioned in microblogs. Nonetheless, we found out that when discussing Zheng Shuang’s case, there was greater support among Weibo users for her surrogacy than the practice in general. This difference reveals that public opinion towards surrogacy varies depending on the context and individual case and could be impacted by celebrity culture. Accordingly, we suggest that health providers should be more actively engaged in the public debate on health-related knowledge and behaviors, and in this case, educating the public about the intricacies of surrogacy and ART via social media. Public education on the issue can enable a more informed debate on practical concerns regarding surrogacy and ultimately a more substantive considerations and rational discussion on its regulation in China.

Availability of data and materials: The datasets generated and analyzed in the study have not been made publicly available in order to protect the identities of Weibo users in accordance with the newly promulgated personal data protection law in China. The corresponding author may provide access to the raw, anonymized data upon request and for academic purposes only.

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