In contemporary society, information and communication technologies (ICTs) are widely cherished for helping transnational households preserve a coherent sense of familyhood despite geographical separation. Despite ICTs having positive benefits for the maintenance of long-distance intimacies, digital asymmetries characterized by gaps in routines, emotional experiences, and outcomes of ICT use can also emerge between family members of different structural, social, and geographical conditions. Drawing on an innovative “content–context diary”-cum-participant observation, this article investigates the multi-dimensional digital asymmetries emerging from the transnational communication of Chinese “study mothers” in Singapore. Using the data visualization and analysis tool “ecomap,” the findings uncover that study mothers were largely beleaguered by expectation asymmetry and autonomy asymmetry, arising from different expectations to and control over daily transnational communication with their family members. The study mothers were disadvantaged by their relatively isolated life situations in the host society and accentuated gender hierarchies in the household.

Keywords: Digital Asymmetry, Information and Communication Technologies (ICTs), Transnational Communication, Gender, Participant Observation, Ecomap, Chinese Migrant Mothers

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and views ranging from the barest minimum to the full onslaught of aural and visual expressions, ICTs have become a veritable sociotechnical phenomenon. The panoply of communicative platforms, modes, languages, and codes offered and powered by ICTs have firmly entrenched them in the communicative arsenal that people use to make social connections, both direct and mediated.

For international migrants and their remote family members, in particular, ICTs are venerated as the “social glue of transnationalism” (Vertovec, 2004) which allows them to remain involved in each other’s daily life routines and perform familial responsibilities regularly, even from afar (Baldassar, 2016; Madianou & Miller, 2011; Wilding, 2006).

Despite ICTs strengthening long-distance intimacy, mediated communication is not equally liberating for every family member (Horst, 2006; Parreñas, 2005). Digital asymmetries, characterized by gaps in routines, emotional experiences as well as outcomes of ICT use (Lim, 2016), can and do emerge between transnational family members of different structural, social and geographical conditions (Benôzet, 2012; Clark, 2012; Madianou, 2014). In the home, digital asymmetries can exist along multiple axes, including access, competency and power asymmetry (Lim, 2016). In transnational households, many such asymmetries tend to become accentuated due to the distinct life rhythms of family members after long-term physical separation.

To shed light on the asymmetrical relationships underlying mediated communication within transnational households, we mounted an in-depth investigation into digital asymmetries experienced by a group of Chinese migrant mothers, with special focus on asymmetries that become more pronounced after the transnational split of the household. Engaging with extant literature on transnational communication, digital and gender inequalities vis-à-vis ICTs, we seek to deepen understanding of the power relations and emotional hierarchies in transnational households and their impact on experiences and outcomes of mediated communication. In particular, the study provides novel insights into how gender positioning could shape ICT use and transnational communication in nuanced ways beyond simply gender differences and traditional household labor division.

The Chinese migrant mothers being studied are “study mothers” (“陪读妈妈/peidu mama”) who accompany their school-going children to pursue a primary or secondary education in Singapore (Huang & Yeoh, 2005, 2011; Wang & Lim, 2017). Becoming de facto “single mothers” after transnational relocation, these mothers rely heavily on ICTs to reconstitute transnational family intimacies (Wang & Lim, 2017).

**Chinese “study mothers” (Peidu mama) in Singapore**

“*Peidu mama* (陪读妈妈)” or “study mothers” originate from the burgeoning family arrangement of “education migration” among middle- and upper-middle-class households across East Asia. In typical households undertaking education migration, mothers uproot and resettle along with their children who receive education in more developed, English-speaking countries, while fathers remain in the home country to continue working and provide financial support (Huang & Yeoh, 2005; Lee, 2010; Waters, 2002). Compared to the fathers who retain their existing jobs and social relationships, *peidu mama* tend to pay a higher price for the migratory journey as they disrupt their lives and sacrifice their own career aspirations, social lives and marital intimacy to care for their children (Chee, 2003; Huang & Yeoh, 2005; Jeong, You, & Kwon, 2014). This emerging trend is witnessed across Asia, including “astronaut families” from Hong Kong and Taiwan (e.g., Chee, 2003; Waters, 2002), “kirogi families” from South Korea (e.g., Jeong et al., 2014; Lee, 2010), and “*peidu* families” from Mainland China (e.g., Huang & Yeoh, 2005, 2011; Wang & Lim, 2017).
Studies have revealed that the international education imperative is deeply rooted in middle-class aspirations of reproducing their relatively privileged social status and maintaining upward mobility (Waters, 2006). With Asia experiencing heightened globalization, "cosmopolitan" academic credentials and strong English language skills leading to enhanced cultural capital derived from overseas education are seen as sound guarantees of such class reproduction (Huang & Yeoh 2005; Waters 2006). Therefore, overseas education of adolescent children has become the top priority of growing numbers of middle-class Asian families, meriting painstaking journeys to unfamiliar foreign lands and transnational split of households (Chee 2003; Huang & Yeoh, 2005). In the Chinese context, the long-standing tradition of heavy parental investment and the "one-child policy" combine to place the child as "only hope" of the family, further accentuating the education imperative (Fong, 2004; Huang & Yeoh, 2005). Chinese mothers, who have historically been socialized to have stronger affective connections with their children and shoulder more nurturing responsibilities than fathers (Chee 2003; Zang, 2003), are expected to devote every effort to supporting children’s overseas education, foregoing their own career prospects and emotional wellbeing (Chee, 2003; Huang & Yeoh, 2005, 2011).

Singapore is one of the most popular destinations for Chinese peidu families due to its cultural proximity to Chinese society, bilingual education system (English with Mandarin/Malay/Tamil), incentive schemes for foreign students and their care-givers and relative affordability (Huang & Yeoh 2005, 2011). The first wave of peidu mama arrived in Singapore around 2000 after the Singapore government started to issue a special type of long-term social visit pass to “Mother or Grandmother of a child or grandchild studying in Singapore on a Student’s Pass” (see the website of Singapore “Immigration & Checkpoint Authority”). This gendered immigration policy confirms the dependent status of study mothers in Singapore, and determines that their connection with the host society terminates immediately if their children quit the overseas education or enter college. Compared to business or skilled immigrants who enter the destination country as citizens or potential citizens, study mothers remain as “transient sojourners” (Huang & Yeoh, 2005) whose privileges and opportunities for career, further education, investment and so on are highly restricted (Huang & Yeoh, 2005, 2011).

Most peidu mama are well educated and had formal employment in China, yet gave up their previous occupations to become full-time mothers or take on unstable jobs after relocation (Huang & Yeoh, 2005, 2011; Wang & Lim, 2017). In particular, the high tuition fees and living expenses in Singapore drive some mothers hailing from lower-middle-class families to seek local employment so as to make ends meet. However, barriers such as poor English proficiency, unrecognized foreign credentials and restrictive immigration policies necessitated that they take on “menial” jobs as cleaners, waitresses, and masseuses (Huang & Yeoh, 2005). For these relatively well-educated women, exclusion from the professional job market often resulted in poor self-esteem and financial dependence on their husbands, thereby leading to the renegotiation of family relationships and reinforcement of traditional gender labor division in the household (Chee, 2003; Huang & Yeoh, 2005; Waters, 2002).

Digital asymmetries in transnational households

For transnational households, ICT-mediated communication enable information, emotions, and care to transcend geographical and temporal boundaries, thus allowing physically split households to keep affective family bonds alive (Horst, 2006; Vertovec, 2004; Wilding, 2006), stay updated on one another’s emotional wellbeing and provide help when necessary (Baldassar, 2016; Madianou & Miller, 2011; Uy-Tioco, 2007; Wilding, 2006). With the prevalence of smart ICT devices and the proliferation of digital applications, transnational families are increasingly enveloped by “poly-media” (Madianou
and strategically employ a constellation of ICTs to meet different communication needs and manage relationships (Madianou, 2014; Madianou & Miller, 2012; Wilding, 2006).

Despite hallowed expectations about ICTs sustaining long-distance intimacy, they can also introduce digital inequalities between family members in terms of differential access and potential gains (Courtois & Verdegem, 2016; Dimaggio & Hargittai, 2001). Whereas “digital divide” describes a gap between ICT “haves” and “have-nots,” digital inequality encompasses multi-layered disparities in digital skills, support, autonomy and uses (Dimaggio & Hargittai, 2001; Hargittai, 2002; Hargittai & Walejko, 2008; Pearce & Rice, 2013; Reisdorf & Groselj, 2017; van Deursen & van Dijk, 2014). Whilst these digital inequalities typically occur between individuals of different socio-economic profiles, they can also emerge within the home with inequalities emerging between members of the same family (Clark, 2012; Lim, 2016).

Lim (2016) proposes the notion of “asymmetry” to describe inequitable mediated relationships between family members, explicating a typology of asymmetries including: (a) access asymmetry—different connectivity levels due to gaps in availability of ICTs which are typical among transnational families; (b) competency asymmetry—deficit of technical skills to exploit ICT affordances; (c) power asymmetry—controlling and imposing conditions on ICT use of/by other family members; (d) expectation asymmetry—disparity in expectations of mutual contactability and responsiveness in mediated communication; and (e) value asymmetry—conflicting attitudes towards ICTs and their utility.

In transnational households, digital asymmetries tend to sharpen as previously hidden dimensions may come to the fore and new dimensions may emerge after a long period of physical separation (Benítez, 2012; Parreñas, 2005). Previous studies have scrutinized access asymmetries between migrants and their left-behind family, usually with the former enjoying superior connectivity and higher quality of mediated communication than the latter (e.g., Cabalquinto, 2018; Madianou, 2014; Parreñas, 2005). Competency asymmetries were also widely noted within transnational families where adolescents and young adults possess stronger digital skills than their elders (e.g., Katz, 2010; Tripp & Herr-Stephenson, 2009). Power asymmetries also manifested themselves in surveillance and demonstrations of authority via remittances (e.g., Cabanes & Acedera, 2012; Hannaford, 2015; Madianou, 2014; Mckay, 2007; Parreñas, 2005). In particular, unidirectional surveillance via ICTs was frequently witnessed between physically separate husbands and wives, with those who migrate as breadwinners exploiting this power asymmetry (e.g., Cabanes & Acedera, 2012; Hannaford, 2015).

Although previous research has provided considerable insights into such asymmetries, the focus has mainly been on the objective existence of salient disparities in ICT access, skills, practices and power relations. Digital asymmetries that derive from subjective perceptions of family members in relation to unequal mediated relationships, information sharing and emotion flows, such as expectation asymmetry and value asymmetry, have been less closely investigated. The present study seeks to fill this gap by delving into the perceptual and emotional asymmetries that emerge or become accentuated only after the physical separation of the household. In addition, the study also explores the socio-cultural and contextual reasons behind these asymmetries and emotional negotiations of study mothers as they cope with negative transnational communication experiences.

**Gender, household ICT use and positionality**

In investigating study mothers, gender is an inescapable issue as theirs is a distinctly gendered family arrangement. Gender inequality is inherent in the tacit consensus that mothers should assume greater
responsibility than fathers in nurturing their children and must prioritize their children’s education over their careers should the two come into conflict.

Previous studies have identified various gender asymmetries in household ICT adoption. For instance, women often have less access and weaker ICT skills than men, although this gap is narrowing among urban families (e.g., Fortunati, 2002; Ling & Haddon, 2003). As for purposes and practices of ICT use, women tend to engage intensively in maintaining family ties and juggling work–family tensions, while men actively seek recreation and coordinate extra-domestic life (e.g., Clark, 2012; Ling & Haddon, 2003; Wajcman, Bittman, & Brown, 2008). Gender differences also exist in expectations around mediated communication, with women expecting faster responses to media messages and reacting more strongly when their partners fail to reply on time (e.g., Su, 2015). While these studies have shed considerable light on the differences gender brings to uses of mediated communication, more attention must be paid to nuanced socio-cultural and contextual factors underlying gender differences.

To understand digital asymmetries in relation to the gendered life experiences of study mothers, we draw on the theory of positionality (Alcoff, 2006) which regards gender as an interpretive horizon from which people understand, engage in and make sense of various contexts of their everyday life. A horizon refers to the range of substantive vision available to a specific individual from his/her ascribed social position from which one gains access to certain layers of reality and resources, which determine who (s)he is, how (s)he experiences the world, as well as how (s)he is recognized by others. In a stratified society, people of different positionality are assumed to possess varying levels of priority and autonomy in making life choices, such as career paths, political and religious dispositions, family, and community relationships, etc. For women, gender positioning provides not only a social and moral baseline for calibrating social interactions and negotiating social roles, but also determines how they are treated by others. As exemplified by Alcoff (2006) with her own gender experiences, her white middle-class lesbian identity positions her in a superordinate status relative to African Americans in her town, but also marginalizes and vilifies her in a mainstream heteronormative culture such that she cannot even retain custody of her children.

Research method

We employed a “content–context diary”-cum-participant observation to study 40 peidu mama in Singapore between April 2016 and August 2017. Participants were recruited through a combination of convenience sampling and snowball sampling. Specifically, the initial batch of participants were approached through local networks of Author A and sending recruitment advertisements in Chinese instant messaging application QQ to chat groups of Chinese parents in Singapore. Subsequent participants were approached via snowballing from earlier waves and selected to achieve diversity in demographic traits (e.g., age of child, years of relocation, etc.).

At the time of the research, participants were aged 28–50, with an average age of 42. These mothers were relatively well educated, where more than three-quarters (31 out of 40) had college degrees or higher qualifications. 30 of the 40 participants had had full-time employment in China, working as civil servants, teachers, entrepreneurs, HR professionals, accountants, etc. After resettlement in Singapore, only 18 participants had (or once had) local employment, the overwhelming majority (15 out of 18) working in part-time jobs as Chinese tuition teachers and cleaners. Their children were aged six to 20 and studying in primary through to high school, junior college, and institutes of technical education (ITE). Hailing from middle-class families, all the participants and their husbands have
full access to basic ICTs (e.g., smartphones, tablet computers, laptops) and the Internet. In Singapore, the participants deployed a wide constellation of ICT platforms to meet various everyday needs of communication, information searching, children’s education, entertainment, etc. They relied heavily on ICT-mediated communication to sustain intimate ties with family and friends back home, while forging new social networks, especially with other *peidu mama*, to garner emotional support in the host country.

During fieldwork, each participant was shadowed for two full days by Author A—one weekday and one weekend day—for six to 12 hours. The observations were conducted in various everyday settings such as their homes, workplaces, shopping malls and children’s playgrounds. Participants were requested to go about their lives as they usually do, while Author A observed their daily mediated communication routines and interacted with them when necessary. With the participants’ consent, Author A also took photos or screenshots of media contents on their ICT devices and/or notes of these contents. After completing the two-day observation, each participant was given S$150 shopping vouchers as a token of appreciation. The research protocol was approved by the National University of Singapore Institutional Review Board (IRB).

A researcher-administered “content–context diary” was employed to record both content- and context-related aspects of participants’ mediated communication. Content-related aspects included correspondents and platforms of communication, details of the content exchanged, modes of expression, etc., while context-related aspects encompassed temporal and spatial settings of ICT use, participants’ attitudes and emotions, special behavior, and the sentiments and intents of mediated communication. In communication research, diary recordings have been widely used to record people’s ICT use routines (e.g., Lim & Pham, 2016; Ling & Haddon, 2003), mostly adopting the diary as participants’ self-reports which may strip ICT use behaviors of their contextual meanings and omit nuanced information due to memory bias or poor recall. Unlike participant-administered diaries, real-time diaries kept by the researcher during immersive observation allowed “live,” accurate capturing of contextual details, which helped to identify nuanced asymmetries and emotional negotiations in the participants mediated communication.

Semi-structured and informal interviews were also incorporated into the observation to gather background information and elicit participants’ subjective opinions. For each participant, two semi-structured interviews were conducted, one before or on the first day of observation and the other on or after the second day of observation. Interview questions covered various aspects of participants’ everyday lives and ICT use, including their demographic and socio-cultural backgrounds, devices and applications used, mediated communication routines with family members, perceived asymmetries and tensions arising from transnational communication, etc. Informal “probing interviews” occurred when special or complex issues emerged during observation (e.g., a flash of anger after receiving a message), with the purpose of drawing out participants’ subjective explanations of these issues. As a native Chinese speaker, Author A conducted all the interviews and observations in Chinese. With the participants’ consent, all interviews were audio-recorded and transcribed in Chinese for analysis.

The qualitative data collected from participant observation was analyzed by Author A through thematic coding (Boyatzia, 1998) with NVivo. Digital materials involved in the coding spanned a variety of forms, including text-based data of content–context diary entries, interview transcripts and field notes, and photographic data such as screenshots of participants’ mediated interactions. The coding process was conducted in Chinese, with significant codes and quotes translated verbatim into English.

Another data analysis method used was the “ecomap” technique which visually represents family life vis-à-vis its relationships, social networks and exchange of support with external systems (Hartman, 1995; Ray & Street, 2005; See Figure 1 for an example). Originally developed as a graphic
assessments, the ecomap helps practitioners and researchers to identify tensions, conflicts, challenges, and gaps in social networks that impair family functioning, to which families and individuals themselves may be oblivious.

We developed a prototype ecomap to chart the mediated communication routines of participants with their full range of contacts. The adapted model—“communication ecomap”—provides a comprehensive and pithy insight into the kinds of ICTs adopted by participants, how they are used, for what purposes, and with what implications for their relationship management (see Figure 2 for an example). It also helps to delineate flow of information, emotions, and power relations in the process of mediated communication, thereby highlighting potential digital asymmetries. The communication ecomap echoes the application of mental maps in portraying migrants’ life experiences and social relationships (e.g., Gould & White, 1974; Hepp, 2008), thus serving as a suitable model to study relationships and resource flows within families.

A communication ecomap was drafted in hard copy for every participant during or after fieldwork, where the participant is represented by a circle at the center. Her husband and child (ren) are presented as circles on the right, while other contacts as rectangles on the left. Lines of different forms, colors, thickness, and directions are drawn between nodes to indicate varying strengths of relationships and flows of information, emotions, and power in transnational communication.

Figure 1 An example of an ecomap (drawn according to Hartman, 1995).
Data Availability
The data that support the findings of this study is available from the corresponding author, upon reasonable request and subject to conditions imposed by institutional ethical approval.

Findings
As the participants were middle class and relatively well educated, digital asymmetries mostly arose from implicit socio-cultural inequalities rather than practical constraints of accessibility, affordability and technological competencies (see also Madianou & Miller, 2012). Indeed, we found expectation asymmetry and autonomy asymmetry especially salient as these migrant mothers were disadvantaged by tacit gender inequalities as well elaborate below.

Expectation asymmetry: Contactability, responsiveness and emotional investments
Expectation asymmetry is characterized by an asymmetrical flow of information and emotions in mediated communication, where one party demonstrates distinctly less contactability, responsiveness and emotional investment in mediated communication. While Lim (2016) describes expectation asymmetry in relation to different contactability between parents and children, in this study we...
expand the scope to encompass asymmetrical expectations to emotional disclosure and flow of care via ICTs. In other words, expectation asymmetry not only encompasses “getting in touch,” but extends to the quality of communication and perceived degree of intimacy.

Expectation asymmetry was most frequently noted between our participants and their left-behind husbands, with these mothers feeling the weight of the asymmetry. Many participants reported taking the initiative to contact their husbands and invested considerable affective labor in these conversations, while their husbands often displayed a perfunctory attitude and would on occasion ignore their messages entirely. Ms Yue (for confidentiality, all participants’ names are pseudonyms), a 39-year-old mother of two boys, complained about her husband’s indifference to her. In her communication ecomap (Figure 3), the green and orange lines between her and her husband show that information flows strongly from her to her husband, while the reverse flow is substantially weaker and increasingly wanes over time. Ms Yue lamented that she often found herself “performing a soliloquy” (唱独角戏, chang dujiaoxi) where she extensively shared her life experiences and feelings with her husband, while he only had curt and cold responses. For example, she once sent him dozens of messages on instant messaging app WeChat early one morning after seeing the doctor, to update him about her poor state of health. However, he did not reply until the evening and only asked briefly “what did the doctor say,” without offering any modicum of care and emotional support.

Although women have long been viewed to involve more intensively in family communication and expect faster responses to communication than their male partners (Clark, 2012; Ling & Haddon, 2003; Su, 2015), Ms Yue’s expectation asymmetry was not due to her gendered position in the

Figure 3  Ms Yue’s communication ecomap.
household but shaped only after transnational relocation. As a professional woman with a master’s degree, she was a manager in a pharmaceutical company before heading to Singapore. Back in China, she and her husband were both very preoccupied with work and thus occasionally missed each other’s phone calls or failed to respond to each other’s messages on time. In this sense, they managed to forge a fairly equitable relationship of “mutual low contactability” which did not trigger asymmetrical experiences on either side. After relocation, Ms Yue’s transition into a full-time mother and part-time direct seller who spent most of her time at home led to a slower pace of life. When she focused her energies on family communication, her husband maintained his hectic work schedule, thereby leading to a stark mismatch in their mediated communication rhythms.

Ms Xia, 47, mother of a 14-year-old daughter, was similarly disappointed in her left-behind husband. Unlike Ms Yue’s husband who was unwilling to provide prompt responses to media messages, Ms Xia’s husband maintained a high degree of contactability and sometimes initiated the conversations. However, he paid exclusive attention to pragmatic issues such as the children’s education and money transfers, while almost never sparing time for expressing concern or exchanging emotional experiences. In contrast, Ms Xia tended to display more concern for his health and wellbeing, which he often dismissed as “useless and time-consuming” (see Figure 4 for the diary excerpt of a typical scenario).

Such subtle asymmetries were also triggered by transnational migration and evolved over time. As Ms Xia recounted, when she and her daughter first moved to Singapore, her husband was quite active in checking on her wellbeing. Relinquishing her high-status occupation as an engineer in a manufacturing company, Ms Xia experienced a painful process of self-adjustment before eventually adapting to her new role as a full-time mother. During this period, she relied heavily on mediated communication with her husband for emotional support. However, since her husband could not empathize with the struggles of being a study mother, he gradually become impatient at her frequent display of negative emotions and regarded her as “too fragile.” Over time, Ms Xia also started to accept the efficient and task-oriented mode of information exchange preferred by her husband to avoid the emotional pain arising from sharp expectation asymmetries.

![Figure 4](https://academic.oup.com/jcmc/advance-article/doi/10.1093/jcmc/zmaa012/5929328)
Expectation asymmetry also occurred between study mothers and their children, where mothers were again on the disadvantaged side. Resonating with previous studies, adolescent children of many study mothers regarded mediated communication with parents as burdensome, and therefore engaged in minor “rebellions” to avoid or minimize the likelihood of parental contact (e.g., Clark, 2012; Ling & Yttri, 2006). During our fieldwork, many participants lamented that it was always they rather than their children who initiated mediated conversations and invested more emotions and care in these dialogues. In contrast, their children often replied in a cursory and testy manner, resorting sometimes to excuses to avoid responding, such as claiming their phone battery was dead, preoccupation with school obligations, etc. Such expectation asymmetries already existed previously but became especially pronounced after overseas resettlement as these mothers tended to invest more time and energy in their children when not distracted by work and other family matters.

**Autonomy asymmetry: Rule-making, space-time priority and hierarchy of ICT use**

Autonomy asymmetry refers to differences in the extent to which one can freely decide when, where and how s/he can use ICTs. It reflects tacit power relations and hierarchies in the household, constituting a variant of “power asymmetry.” Compared with power asymmetry which emphasizes one’s ability to imposing conditions on the ICT adoption and use of other family members (Lim, 2016), autonomy asymmetry concentrates on one’s liberty to determine one’s ICT use routines without any perceived constraints or inhibitions.

For our participants, the most apparent autonomy asymmetry occurred between them and their children, with children having limited control over their own ICT use due to their mothers’ close supervision. Resonating with previous research on parental mediation of children’s online activities, our participants employed a range of approaches to monitor and regulate their children’s use of ICTs, including setting space-time restrictions, reviewing digital footprints, co-viewing media content, etc. (see also Haddon, 2012; Livingstone, 2007; Livingstone & Helsper, 2008).

Nevertheless, having authority to regulate children’s mediated activities did not guarantee study mothers themselves the greatest autonomy of ICT use in the household. Instead, many of them identified themselves as the least prioritized people whose ICT use routines were highly dependent on the space-time arrangements of other family members. For the aforementioned Ms Yue for example, the blue lines in her communication ecomap (Figure 3) indicates that both she and her sons were subject to autonomy asymmetries, but in different forms and opposite directions. Admittedly, she had an overwhelming advantage over her sons in deciding what ICTs could be used at home and how. However, her own ICT use routines were highly constrained. In particular, she deliberately eschewed entertainment on ICTs in the presence of her sons in case she interrupted their schoolwork or tempted them to use their devices. During the observation, she was found to wear earphones whenever she watched videos, even when in a different room from her children. On the contrary, her sons could play the iPad at full volume even when she was sleeping or learning English, as long as they did not exceed the maximum daily screen-time limit prescribed by her.

Such autonomy asymmetry already had its kernel before the household’s transnational split but developed into a visible asymmetry after resettlement. The children’s education was always the family priority so even before relocation, both Ms Yue and her husband tried their best to minimize recreational ICT use in front of their children to serve as positive role models. They had lived in a large apartment where each family member had their own private space, so she could engage in mediated activities anytime without concerns about distracting her children. After relocation however, she shared a bedroom with her sons, straining her ability to “hide” when she sought leisure time on ICTs.
Similar asymmetries in space-time autonomy also existed between participants and their husbands, where the women enjoyed significantly less autonomy in their transnational communication routines. Specifically, since many of the husbands had intensive workloads and unpredictable schedules, it was taken for granted that they should determine the appropriate time and duration of mediated communication, even though the mothers were also stretched with domestic chores and child-minding. For example, Ms Feng, 40, a full-time study mother with a 13-year-old daughter, explained the trials of coordinating timings for a phone call with her husband (see the diary excerpt in Figure 5).

In the evening, she sent her husband a smile emoji on WeChat as usual, indicating that she and her daughter had finished dinner and were ready to chat. She then proceeded with her housework while waiting for her husband to finish work and call them via landline phone or WeChat. As such, when and how the mediated communication could happen largely hinged on her husband’s work schedule, while she had to keep pace with his life rhythm and would unfailingly be on “stand by” for his call. Ms Feng explained that whenever she had any information to share with her husband, she would make a mental note and do so at the “proper” time rather than calling him spontaneously to avoid disrupting his work schedules. In contrast, when her husband wanted to talk to her, he would call her right away, and she felt obliged to reply immediately for fear of worrying him. Behind this obvious asymmetry was the default assumption that Ms Feng, being the full-time mother, should always be contactable at the drop of a hat, while her husband, as the breadwinner deserved the priority of picking the most convenient time for communication because he obviously had “more important tasks.” Like most of the other asymmetries described previously, such autonomy asymmetry also emerged after Ms Feng’s transition from professional woman to a full-time mother post-relocation.

**Figure 5** Diary excerpt of Ms Feng’s use of a laptop and iPad.

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**Behind digital asymmetries: Isolated domestic life and gender positioning in the household**

While the afore-mentioned expectation and autonomy asymmetries gradually emerged and evolved after the household’s transnational separation, they were often highly nuanced and remained inconspicuous even or especially to the participants themselves. Our findings suggest that these mothers are so deeply entrenched in their gender positioning within the home that they became their unquestioned, taken-for-granted life arrangements. For our participants, gender positioning and inequalities
constrained their life choices and experiences even before they became study mothers when they—rather than their husbands—were compelled to sacrifice their careers for their children’s education. After relocation, their social role ineluctably led them to be labeled as de facto “single mothers,” financially-dependent women, foreigners with precarious residential status, etc. These influenced their inferior self-positioning in the family and in society, and exacerbated the gendered gaze and expectations of others, thus silencing them in the face of digital asymmetries.

Indeed, it was their isolated life situation in the host society that contributed most to solidifying their disadvantaged positions. Our participants’ limited English proficiency, lack of internationally-recognized credentials and Singapore’s conservative immigration policies foreclosed attractive employment opportunities, relegating them to the ranks of full-time, unemployed mothers or holding only part-time jobs. As a result, the daily routines of many participants were dominated by trivial and time-consuming domestic chores, such as cooking, laundry and room cleaning, and mundane coordination of family affairs. Nevertheless, their efforts in running the family logistics and bonding family ties were trivialized and diminished by themselves and their family, leading to them being perceived as “idlers” who enjoyed luxurious space-time flexibilities but with “nothing important to do.” Therefore, in mediated communication, there was the unspoken assumption that these mothers should always submit to the preferences of other family members with “weightier” responsibilities, while their own needs were deemed secondary or inconsequential. As shown in the aforementioned case of Ms Feng, her husband was only concerned about whether her daughter was available when he initiated a mediated conversation, while Ms Feng was presumed to be always available.

Further aggravating the isolated experiences of study mothers is the severe paucity and homogeneity of their support networks. After relocation, they became alienated from a large proportion of their left-behind friends in China due to the vast geographical distances and disparate life rhythms. At the same time, their new networks in local communities were highly limited by language barriers and cultural differences. Even participants who reported healthy social networks in Singapore were largely constrained to the circumscribed social circles of co-national friends, with some even relying exclusively on small groups of fellow study mothers for daily socializing and emotional exchange. These culturally homogeneous social networks amplified the repetitious flow of information, skills and support, which—lacking much needed diversity—further marginalized them in the host society and anchored them at inferior positions in their households.

Whilst similar digital asymmetries are widely experienced by women who are full-time homemakers, they are particularly painful for study mothers as many of them were suddenly thrust into isolated domestic lives without sufficient mental preparation for this major renegotiation of family relationships. For these well-educated women, exclusion from the professional job market, abrupt loss of financial dependence, and palpable decline of life quality often resulted in severe sense of insecurity and self-doubt. They were thus particularly needy for emotional support via mediated communication with family and felt easily disheartened when perceiving neglect by their loved ones. In the case of Ms Yue, for instance, she became vulnerable to expectation asymmetry only after she started to invest significantly more time and emotions in mediated communication than before, to a degree that her husband failed to match.

Discussion and conclusion

Unlike many other transnational households that tend to suffer from access asymmetry in the availability of ICT infrastructures (Lim, 2016; Parreñas, 2005), the study mothers experienced asymmetrical flows of information, emotions, and power relations in mediated interactions with their families.
Drawing on positionality theory (Alcoff, 2006), we posit that these women’s gendered identity as “study mothers” created a unique horizon of resources and autonomy which both empowered and disempowered them. On the one hand, originating from middle-class families, they were never trapped by asymmetries of ICT access that hobbled migrants from less-well-off backgrounds, such as refugees and foreign domestic workers (e.g., Cabalquinto, 2018; Parreñas, 2005; Wilding, 2006). Being relatively well-educated professionals before relocation, they rarely experienced discernible gaps in digital skills with their husbands (e.g., Kang, 2012). While competency asymmetries did exist between these mothers and their children, as seen in previous studies on “bottom-up transmission” (Correa, 2014) and “media brokering” (Katz, 2010), these asymmetries were not affected by gender positioning and transnational separation of the family. Given their relative educational and professional parity with their husbands, these mothers also did not fall victim to palpable power asymmetries such as unidirectional digital surveillance (e.g., Cabanes & Acedera, 2012; Hannaford, 2015).

However, their gender identity as study mothers did limit them to the exclusive social role of motherhood and considerably confined their agency. Bereft of employment after migration, these mothers were suddenly thrust into an isolated life situation which denied them autonomy and reduced them to secondary members of the family. In this context, they ended up disadvantaged by digital asymmetries, which stands in contrast to female migrants who venture overseas for work opportunities and thereby have a louder voice in the household (e.g., Medianou, 2014; Parreñas, 2005). Moreover, as de facto “single mothers” holding unstable residential status, the study mothers were highly marginalized in the host society, which constrained their opportunities of accessing heterogeneous social resources outside the domestic sphere and further accentuated traditional gender labor divisions in the household.

These findings suggest that while gender assumes a significant role in shaping mediated communication experiences of study mothers, its impact is neither straightforward nor persistent, but mediated by and suffusing everyday life situations. Gender subjugates women to certain social expectations and obligations that necessarily introduce asymmetrical relationships in the maintenance of family communication. In mediated communication, gender identities and gender roles prescribe tacit moral codes about what kinds of ICT use routines are (not) appropriate for a woman as well as what outcomes she should (not) expect from mediated relationships, which renders her submitting to and even internalizing digital asymmetries over time. For instance, expectation asymmetries between study mothers and their left-behind husbands developed out of their gendered choice of becoming a study mother. As in the case of Ms Yue and Ms Xia, these mothers only felt the burning desire of emotional support from their husbands after the transition from busy professional to full-time mothers living an isolated domestic life in the unfamiliar foreign land.

This study integrates and contributes to literature on transnational communication, digital inequalities as well as gender in ICT use through an in-depth investigation into digital asymmetries emerging in transnational family communication of study mothers as well as the role of gender positioning in shaping asymmetrical experiences. Findings from this study can provide references for understanding mediated communication experiences of other types of transnational households. For example, similar expectation asymmetry and autonomy asymmetry can also evolve between female foreign workers and their left-behind family members, while these female workers may take entirely different positioning within the asymmetries as compared to study mothers.

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