SHIFTING PARTNERSHIP IDEALS WITH ONLINE TECHNOLOGIES AMONG UNMARRIED WOMEN IN INDIA

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Abstract

This study complements existing scholarship in family sociology and digital demography by investigating the role of digital technologies in shaping partnership ideals among unmarried women in India. We build on the premise that, by means of faster communication, effective information dissemination, and reciprocal exchange of norms and ideals, recurrent exposure to globalized cultural scripts through the Internet may shape family-related outcomes such as views and opinions regarding different aspects of family life. Leveraging new data from a primary representative survey of unmarried yet partnered women living in cities across 20 states, we find that daily Internet use is positively and significantly associated with modern partnership ideals measured as secularized views on the choice of a partner, the importance of marriage, partner preferences, and views about love marriage. Moreover, we show that accessing the Internet independently – vis-à-vis through a shared device – is what matters the most, and that results are stronger among high-educated individuals. We offer *prima facie* evidence that these findings can be deemed causal complementing our results with an Instrumental-Variable (IV) approach leveraging digital geographical information. Our findings reveal that digital technologies may be gradually contributing to shifting views about marriage and family formation, even in a context such as India which has traditionally exhibited strong resistance to modernization forces, at least in the realm of the family.

Keywords: Union formation; ideals; Internet; technology; India

Introduction

The so-called "digital revolution" is affecting every aspect of daily life across the world, but particularly so across low- and middle-income countries (LMICs), where technologies such as mobile phones, mobile Internet, and broader Internet access have diffused very rapidly, even at times skipping the landline phase of development (Aker & Mbiti, 2010). Family outcomes are no exception among these, with a growing body of research documenting how access to the Internet shapes fertility, marriage, divorce, migration, and gender-related outcomes in contexts as varied as China, Malawi, Germany, Italy, Ethiopia, Tanzania, etc. (Billari et al., 2019, 2020; Pesando, 2022; Pesando et al., 2021; Rotondi et al., 2020; Zheng et al., 2019). A recent study from Germany found that the availability of broadband Internet affects fertility outcomes of highly educated women by allowing better family/work reconciliation (Billari et al., 2019). In a completely different setting – eight sub-Saharan African countries – Toffolutti et al. (2020) found daily Internet exposure to be associated with a positive increase in modern contraceptive uptake, especially among poorly educated women.

In light of this blooming literature, this study explores the role digital technologies – and, in particular, daily Internet access – may play in affecting partnership ideals in India. We define partnership ideals as views and opinions regarding different aspects of family life related to union formation, such as choice of partner, importance of marriage, partner preferences, views about love marriage, etc. In line with sociological work on developmental idealism and world society perspectives (Meyer et al., 1997; Szreter, 2015; Thornton, 2001; Thornton et al., 2012)

and economic scholarship on the role of the media in shaping social development outcomes through diffusion processes (Banerjee et al., 2019; Durante et al., 2019; Hjort & Poulsen, 2019; Kearney & Levine, 2015; La Ferrara, 2016; La Ferrara et al., 2012; Manacorda & Tesei, 2020), this work builds on the premise that the Internet may provide access to globalized cultural scripts in a swift and timely manner. As such, by means of faster communication, effective information dissemination, and reciprocal exchange of norms and ideals, recurrent exposure to globalized scripts through technology may shape demographic attitudes and behavior, including family-related outcomes (Allendorf et al., 2019; Westoff & Koffman, 2011).

Exploring a question of this kind in the context of urban India provides a novel contribution to the literature for at least three reasons. First, a plethora of online news stress the potential of the digital revolution for partner search, union formation, and the whole wedding industry in India (e.g., "Indian Weddings 2.0: The Digital Revolution in the Wedding Industry" or "How Technology is Changing Indian Weddings"[1]), thus hinting at the possibility that widespread Internet access may play a powerful role in this context. Although online dating appears to have the potential to change how couples meet in India, as it has in other contexts such as Canada, China, Germany, Switzerland, and the United States (Kreager et al., 2014; Ong & Wang, 2015; Potarca, 2017, 2020, 2021; Qian et al., 2022; Qian & Hu, 2024; Rosenfeld, 2017; Rosenfeld et al., 2019), in our study we take a step back from matchmaking and focus

[1] https://www.pinkvilla.com/lifestyle/love-relationships/exclusive-indian-weddings-20-digital-revolution-wedding-industry-885391; https://www.bbc.com/news/world-asia-24727035.

more broadly on whether and how frequent Internet use relates to unmarried women's attitudes and opinions in several realms of union formation.

Second, despite these "breaking headlines," limited work has been conducted on the implications of Internet use for family dynamics in India, aside from small-scale work characterizing the context in which online dating and virtual mate-seeking occur (D. Chakraborty, 2019; K. Chakraborty, 2012). This is mostly due to the lack of adequate survey questions on the use and content of digital technologies, a gap we fill by introducing newly-collected data in the major urban areas of India providing unique information on digital technology such as frequency of use and places the Internet is accessed – alongside variables on dating practices, partnership ideals and preferences, and beliefs on marriage, family, and fertility.

Third, and most importantly, previous studies on union formation and family change in India suggest that India is quite unique among LMICs in that it has shown some resistance to modernization forces, as parents continue to be involved in the vast majority of marital choices, even if they are not the sole decision-makers (Allendorf & Pandian, 2016; Chakravorty et al., 2021), challenging some predictions of modernization theories and developmental idealism (Breton, 2021; Visaria, 2022). Nonetheless, the country has witnessed a steady decline in fertility (Dyson et al., 2004) along with a substantial increase in age at marriage (Desai & Andrist, 2010; Kumari & Shekhar, 2023; Singh et al., 2023), jointly-arranged marriages (Allendorf & Pandian, 2016), education-assortative unions (Sarkar, 2022), and inter-caste marriages (Narzary & Ladusingh, 2019; Ray et al., 2020). These nuanced transformations suggest

that the family demography of India is going through a transition, yet through a hybridized model in which both modern and traditional beliefs and practices coexist (Reed, 2022). As such, a key factor that is yet to be understood is prevailing ideals, particularly among unmarried women, given their potentially more reactive nature to globalized scripts vis-à-vis actual behavior (Pierotti, 2013; Varriale et al., 2022), as well as their role as ultimate drivers of union formation practices in the long term. As the Internet provides a clear proxy for a "modernizing engine" spreading globalized cultural scripts, a study of this kind is well suited to converse with existing sociological work on family change in India, as well as blooming work in digital demography. To the best of our knowledge, this study is the first of its kind to explore digital factors capturing elements of developmental idealism in a culturally diverse population group, now the largest in the world (UN-DESA, 2023).

Background

The Growth of the Internet in India

The growing Internet penetration in India surpassed a new milestone of over 800 million total active users in 2023, meaning that over half of Indians (55%) used the Internet over the previous year. Similar figures suggest that India was home to 467 million social media users in 2023, corresponding to about 33% of the total population. Relatedly, mobile-phone penetration stands at around 77%, with over 1.1 billion active cellular mobile connections (Kantar & IAMAI, 2023). The Global System for Mobile Communications (GSMA) estimates that out of the 200 million new mobile services

subscribers in Asia Pacific by 2025, half of them will be accounted for by India, which will also reach a smartphone penetration of 85% by the same date, in turn enabling users to have access to widespread mobile Internet (Galpaya et al., 2023; GSMA, 2021). These estimates point to a massive global social transformation in the country, which is likely shaping a whole range of social development outcomes, including demographic dynamics. Massive expansion in Internet penetration is occurring also in states that have traditionally lagged behind, such as Jharkhand (46%) and Bihar (37%), which are exhibiting above-average year-to-year growth rates of 12% and 17%, respectively (Kantar, 2021). This is partly driven by declining proportions of non-active Internet users, which lead to Internet services reaching across more and more geographies (Kantar, 2021).

A focus on Internet access and use among women in India is topical as the gender gap – or, so called, digital gender divide – in South Asia is much higher than in other LMICs. Nonetheless, this gap has halved since 2017, suggesting promising avenues for the future (GSMA, 2020, 2021). While changing market dynamics and improvements in the affordability of Internet-enabled handsets and data have likely contributed to the reduction of the gap in South Asia, pandemic-related restrictions and lockdowns have also played a role. In 2020, the number of Indian women who reported using mobile Internet and owning a smartphone grew rapidly, and even faster than for men. Among Indian women, 25% now own a smartphone, compared to 14% in 2019, and 30% use mobile Internet, compared to 21% in 2019 (GSMA, 2021). Overall, official estimates suggest that the gender ratio among all Internet users – not only

mobile Internet – has shifted from 71:29 in favor of males (2015) to a more balanced 54:46 ratio (2022), aligning with the overall sex ratio of the country's population (Kantar & IAMAI, 2023).

Studying implications of Internet diffusion on families in urban India is also relevant as a persistent rural-urban divide remains in terms of access to platforms and platform use, despite shrinking rural-urban gaps in terms of Internet penetration driven by faster growth rates in rural areas (Galpaya et al., 2023; Kantar, 2021; Kantar & IAMAI, 2023). Most of these gaps are explained by skill-based digital divides, i.e., lack of basic digital skills, which is more pervasive in rural areas. Galpaya et al. (2023) estimate that in India in 2021 only 1% of the population without basic digital skills had ever used platforms relative to 22% of those with such skills.

Scholarship on the role of the Internet in family formation processes in India is scant. Essentially, existing studies fall under two streams. One focuses on characterizing the context in which online dating and virtual mate-seeking occur. For instance, D. Chakraborty (2019) explored the correlates of dating-app use in urban India focusing on 296 college goers and young professionals, documenting four main reasons for using apps, namely having fun, drawing life satisfaction, having verbal exchanges (i.e., for companionship), and simplicity of use. Similarly, K. Chakraborty (2012) found that virtual relationships are becoming increasingly common as an "experimental" way through which young Muslim women in urban slums of Kolkata try to alter their life course and expand their social circles. For many women, online

friendships and mate-seeking can be a safe method to meet young men, as it is perceived to reduce corporeal risks.

The second stream focuses instead on "cyber-matchmaking," i.e., the idea that the apparent waning of parental authority is being increasingly replaced by virtual ways of arranging marriages and forming (or, sometimes, preserving) kin. For instance, Agrawal (2015) found that the dominant Indian variant of online matchmaking may at times aid in the sustenance of caste- and community-based identities and networks, albeit in new hybridized forms. For instance, matchmaking may facilitate conventional marriage preferences under conditions that are less than favorable. All in all, this limited existing scholarship underscores that there is ample space for studies assessing the implications of the diffusion of online technologies on a broad range of family outcomes, theorizing on the kind of cultural exchanges that may occur as part of the diffusion of globalized cultural scripts.

Existing Research on Family Ideals in India

The literature on family change in India is extensive and beyond the scope of this paper (for a review, see Allendorf & Pandian, 2016; Chakravorty et al., 2021; Dommaraju, 2016; Ram, 2012; among others). This work focuses specifically on partnership ideals, i.e., views, attitudes, and opinions regarding different aspects of union formation. This is an important outcome, as it is reasonable to expect ideals to be more "malleable" and responsive to modernizing forces than actual behavior, especially in contexts characterized by rooted social and cultural norms and institutions such as families in

India (Netting, 2010). For instance, exposure to globalized cultural scripts through technology may shift women's opinions, views, and preferences towards age at marriage, parental authority, partner preferences, etc., yet rooted institutions such as arranged marriage may make it such that these more secularized views do not translate into actual behavior.

A few scholars have focused on these more "ideational" family outcomes in the context of India, finding mixed results on the role of modernizing forces. On one hand, focusing on fertility and using a combination of micro- and macro-level data, Visaria (2022) found no evidence that the transition to small families in India is due to cultural shifts towards post-modern attitudes and norms that stress individuality and self-actualization. Rather, any noticeable shift would be attributable to high aspirations among urban middle-class parents which can only be fulfilled when they have one or at most two children. On the other hand, leveraging interviews with 30 young professionals in Gujarat, Netting (2010) found that in response to the constant flux of new commodities, medias, and ideas, educated youth are moving beyond the conventional love-versus-arranged marriage dichotomy, embracing broader goals of intimacy, equality, voice, and personal choice. Building on Appadurai's theory on "ideoscapes" claiming that Western-inspired ideals travel across countries by means of migration, media, and technology diffusion (Appadurai, 1996), the author finds that Indian upper-middle-class youth are increasingly responding to modernizing forces by generating culturally appropriate hybrid goals and systems of mate selection.

In this respect, the effects of the growth of the Internet would easily fit within Appadurai's definition of ideoscapes or, rather, "technoscape." The idea of Internet as a technoscape echoes closely Varriale et al.'s (2021) conceptualization of mobile phones as *material elements* ("objects") acting through normative change to shape macro-level cultural scripts affecting *schemas*, i.e., unobserved mental maps through which we make sense, interpret, and experience the external world that surrounds us (as per Johnson-Hanks et al.'s, 2011 "theory of conjunctural action").

Theoretical Perspectives

According to modernization (Cherlin, 2012; Goode, 1963) and developmental idealism theories (Allendorf & Thornton, 2015; Lai & Thornton, 2015), any behavior, belief, and value can be categorized as "modern" if it is in line with a developmental trajectory – or triggered by it. Modern ideals tend to be more egalitarian, to display social/communal solidarity, and to be progressive with current times while at the same time shifting away from traditional norms. Guided by this understanding, if women, for instance, feel they can exercise greater agency in partner selection, place higher value onto achieved (rather than ascribed) socioeconomic attributes of partners, and believe that marriages are primarily about mutual love and companionship, then we could classify these women as holding "modern" values and beliefs. Nonetheless, existing research underscores the complex and often hybrid nature of marriage norms (Allendorf & Pandian, 2016; Reed, 2022), suggesting that partnership ideals may take on complex and, at times, unexpected configurations.

Based on previous discussions and existing cross-national scholarship documenting that digital technologies and Internet exposure may play a key role in the "modernization process" of partnership ideals, we hypothesize that exposure to the Internet will be positively associated with modern partnership ideals in our sample of unmarried urban women (*HP1*). Furthermore, we expect frequent exposure to the Internet to matter more in cases in which women have independent access to technology (e.g., through a smartphone or a personal computer), rather than shared access (e.g., one laptop for all household members). The rationale behind this stronger association (*HP2*) is twofold: first, independent access to the Internet means that exposure to globalized cultural scripts will be magnified due to, potentially, more control over the technology, more time spent online, and a broader ability to access personalized content on a regular basis (e.g., accessing social media, reading news, exchanging information with peers, etc.). Second, independent access to technology is a distal proxy of women's agency within and outside of households (Masika & Bailur, 2015; Pesando, 2022). This is all the more the case in a context such as India in which smartphone and laptop penetration are far from complete (Galpaya et al., 2023), *access-based* and *skill-based* digital gender divides persist (Kantar, 2021), and traditional gender roles coexist with rigid social institutions such as parental authority (Rammohan & Vu, 2018; Samanta & Varghese, 2019).

Alongside technology diffusion and online connectivity, education could play a powerful role in shaping ideals. Yet the potential role of education in shaping partnership ideals is largely dependent on family norms, region-specific cultural

scripts, and related factors. For instance, higher education in India tends to be associated with an increase in the amount of dowry sought among men (Agarwal Goel & Barua, 2023; Munshi, 2017), high son preference (Kohli, 2018), and traditional gender roles held by women (Patel & Parmentier, 2005). Thus, the role of education can be more nuanced than expected. Nonetheless, when combined with Internet exposure, education may play a stronger role than either Internet or education alone as the Internet provides unrestricted global information irrespective of region of living, school or university attended, and prevailing policies in the location of residence. Therefore, we hypothesize that when combined with higher education levels, Internet exposure will be more strongly correlated with prevalence of modern partnership ideals than education or Internet alone (*HP3*).

Data and Methods

Dataset

This paper is based on survey data collected by our team from about 2,000 unmarried-partnered women aged 18 to 37 years, living in 20 cities clustered across all six broad geographic regions in India (see Figure A1 in the Appendix). The survey was conducted in July and August of 2022 with the support of Morsel India, a research organization based in the country. Our survey focuses on urban residents as some sociodemographic transformations such as increasing age at marriage, higher inter-caste marriages, and lower child marriage have been more visible in urban areas (Desai & Andrist, 2010; Narzary & Ladusingh, 2019; Trinh & Zhang, 2021). Surveys were conducted in person

by teams of enumerators in the dominant language for each state, using tablets to record responses.

One goal behind the design of the survey was to ensure that most regions of India were included to capture the substantial cultural, religious, and ethnic variation that exists. We selected 20 of the 37 union territories and states of India that well represented the various regions, and we selected the primary urban area from within each state – see Figure A1 for the surveyed cities within each region. Enumerators recruited respondents in public areas such as educational institutions like university and college hostels, working women hostels, government and private offices, daily wage worker's colony areas, garment factories, construction sites, and renovation sites – see rationale behind this choice in the Appendix. To ensure that enumerators selected women from heterogeneous backgrounds, we requested quota sampling on education to match the educational distribution among urban women in the Demographic and Health Survey (DHS) 2019-21 (100 unmarried respondents from each city).

Although the survey is non-random, most respondents' characteristics in our sample, such as regional and caste representation, are similar to estimates obtained from the DHS (Table A1) when limiting the latter sample to similar age ranges and women living in urban areas – as our data were collected in cities only. The age-wise sample distribution from our survey data is closely comparable too (Figure A2), although our respondents are slightly older than women in the DHS as, unlike the DHS, we targeted unmarried women in relationships. The overall sample includes 2,013 women, yet our analytical sample consists of 1,798 women (89% of the original

sample). While complete information on Internet variables (main predictor) and partnership ideals (main outcome) is available for 1,951 women (97% of the original sample), missing information on basic controls such as education, caste, religion, and region reduce the sample from 1,951 to 1,798 women. As such, we present descriptive statistics and conduct all analyses on this latter sample (analytical sample, henceforth). Attrition analyses and strategies to deal with missing data are discussed later.

Variables

We relied on two variables to capture the role of Internet exposure at the individual level. The first one measures frequency of Internet use through the following categories: never, weekly (or monthly/yearly), and daily. The second measures whether the Internet is accessed through a shared or own device. We intersected these two variables creating two dummies, one for daily Internet access (1 if daily Internet access and 0 otherwise) and another for daily Internet access through own device (1 if daily Internet access through own device and 0 otherwise). For graphical and summary purposes, we also created a categorical variable taking three values: never/rarely using the Internet, using daily on shared device, and using daily on own device. The distinction between shared and own device is a key novelty of this dataset given that other large-scale datasets with information on digital technologies in LMICs – such as, for instance, recent waves of the DHS – do not allow us to measure shared device use, an essential yet overlooked issue in contexts characterized by resource constraints, extended households, and limited decision-making power on the part of specific

household members, most often women (Aiken et al., 2022; James, 2011; Pesando, 2022).

The key outcome variable stems from the measurement of partnership ideals. We first filtered a range of questions recording information on partnership ideals and beliefs across a broad range of domains. The questions are the following: "How important is having prior *acquaintance* with the potential person you want to marry or have a relationship with?" (IMP-A), "How important is receiving *parental approval* to start a relationship and/or enter a marriage?" (IMP-P), "Which of the following people do you think are best to find a partner or spouse?" (BES-P), "How important is the *education level* of the potential person you want to marry or have a relationship with?" (IMP-E), "How important is the *caste* of the potential person you want to marry or have a relationship with?" (IMP-C), "Would you allow your children to do a love marriage?" (LOV-C). All variables are categorical with three or four categories. Questions about importance (IMP-*X*) are coded as "very," "moderately," or "not." BES-P is coded as "self," "parents," "self+parents," and "other." Lastly, LOV-C is coded as "not," "maybe," and "yes." Note that a love marriage can be described as a union where individuals choose their partner based on mutual love, affection, and compatibility, instead of ascribed characteristics such as caste, religion, or social status (Allendorf, 2013; Bhandari, 2020; Sarkar & Rizzi, 2024).

We then created a series of dummy variables for each of the above questions, which were coded as 1 if responses to the specific items were in line with "secularized" ideals and/or more autonomous choices, i.e., if prior acquaintance is very important

(IMP-A="Very"), if parental approval is not important (IMP-P="Not"), if individuals themselves are best suited to choose a partner (BES-P="Self"), if partner's education is very important (IMP-E="Very"), if partner's caste is not important (IMP-C="Not"), and if respondents would allow their children to enter a love marriage (LOV-C="Yes"). Lastly, we created a continuous index built as the row sum of the above 0-1 items, i.e., ranging from 0 to 6 where 0 corresponds to very traditional ideals and 6 corresponds to very secularized or modern. The Appendix discusses alternative ways of classifying these items, all of which deliver consistent results.

Other control variables for the analysis are age (18 to 37 mainly), education (primary, secondary, higher secondary, and university), region (north, central, northeast, west, east, and south), caste (General, Other Backward Classes, Scheduled Caste, and Scheduled Tribe), and religion (Hindu, Muslim, Christian, and Other). To capture broader developmental and technology-diffusion processes at the level of cities and states – alongside potential digital divides – we also included ancillary geographical variables obtained from external sources (see Appendix for full details). Among city-level variables we included light intensity per 1,000 people – a commonly-used proxy for local socioeconomic development (Bruederle & Hodler, 2018; Chen & Nordhaus, 2011; Rotondi et al., 2020), primarily in urban areas (Pérez-Sindín et al., 2021), including in India (Asher et al., 2021) – % of households with access to electricity, and number of 3G, 4G, and 5G mobile networks (ratio of the number in the city relative to the number in all India). Among state-level variables we included

average expenditure on data over the previous month and the share of households with working Internet connection (phone or fibre/ADSL).

Lastly, we merged two other geographical variables that we exploit as Instrumental Variables (IVs), namely city-level download speed (bitrates) and state-level number of deaths from lightning strikes (ratio of the number in the state relative to the number in all India). The rationale behind the choice of these variables is discussed in the next subsection.

Table 1 presents descriptive statistics on the analytical sample. Estimates show that 87.4% of women in the sample use Internet daily, yet this percentage declines to 50.7% when limiting to Internet use through own device. In terms of partnership ideals, 75.8% of women report that knowing the partner before entering a partnership is very important; 82.4% of women report that parental approval is very important; 72% report that partner's education is a very important trait when selecting a partner, while this same estimate declines to 51.6% for the importance of caste. Two of the variables showing some of the most interesting heterogeneities are the following: "best people for partner arrangement" and "allow love marriage for children." In terms of the former, a third of respondents (32.9%) report that finding a partner together with the parent(s) is the best strategy, followed closely by parents choosing the partner alone (32.3%). This estimate aligns closely with the idea of hybridization and the increasing share of jointly arranged marriages (Allendorf & Pandian, 2016; Sarkar & Rizzi, 2024). Conversely, 22.8% of women report that finding a partner alone is the best strategy, followed by other household or kin members (12%). In terms of the latter,

we observe that 70% of respondents would approve a "love marriage" for their children, while 19.5% would not. In terms of basic demographics, respondents are on average 24 years old, primarily having higher secondary (38.9%) or some form of university education (38.9%), coming mostly from the North of India, followed by the South, and predominantly Hindu (83%).

[Table 1 about here]

Analytical Strategy

We start our analysis by descriptively exploring variation in partnership ideals by level of exposure to the Internet. We do so by focusing on each item separately, as well as by creating macro-categories of "Traditional," "Hybrid," and "Modern" from the continuous index introduced above. Next, we run multivariate ordinary least squares (OLS) models using the two Internet dummies as predictors (in separate models) and the partnership ideals index as main outcome. We run four different models adding controls sequentially: i) Internet use only; ii) individual-level controls; iii) city-level controls; and iv) state-level controls (full specification, henceforth). For graphical and summary purposes, we also run multinomial logit models and extract predicted probabilities of falling into the three macro-categories of ideals. To explore the intersection of education and Internet use as compounding predictors, we run models including interaction terms and graphically visualize the resulting coefficients. Models do not include city fixed-effects as city-level and state-level geographical variables are accounted for as controls. All analyses account for weights computed using data from

the DHS (age, region, and education) to make our sample as close as possible to representative of unmarried women in reproductive ages in urban India.

We deal with missing values – primarily driven by missing information on relevant controls – in two different ways. First, we conduct attrition analyses assessing whether partnership ideals differ for women with (1,798) and without (153) information on relevant controls. Second, we rerun all analyses implementing multiple imputation with chained equations, a sequential method filling missing data through an iterative series of predictive models that can accommodate missing data on categorical variables such as education, region, caste, and religion, in our case (Azur et al., 2011; White et al., 2011) – these analyses are provided in Appendix Tables A2 and A3.

Lastly, even though the inclusion of georeferenced controls measuring broader development patterns, technological diffusion, and digital connectivity helps reduce endogeneity concerns, we are working with cross-sectional data. As such, unobserved heterogeneity may prevent us from drawing solid causal conclusions. For instance, although it is reasonable that women using the Internet regularly may hold more modern partnership ideals, it is equally likely that women with more secularized ideals may spend more time on the Internet and/or may be more willing to purchase a smartphone or a laptop with independent digital connectivity. Similarly, there may be real personality differences between women who spend time browsing the Internet and those who do not. While these issues can hardly be solved without experimental

variation, we complement our associations with estimates from Instrumental Variable (IV) techniques as robustness check.

The main assumption for IV approaches is that an exogenous instrument can be found that affects the "treatment" (Internet use) but is excludable from the outcome equation, i.e., is uncorrelated with partnership ideals. We made a good faith effort to identify instruments satisfying these conditions, yet it is hard to exclude all possible threats to validity. We used two variables as instruments. First, a city-level one capturing download speed (bitrates), i.e., the amount of video data being transferred in a particular amount of time. This variable is likely to affect a woman's likelihood to use the Internet regularly (positive *first-stage* coefficient), yet it is arguably exogenous to that woman's partnership ideals – especially after controlling for other measures of technology diffusion and digital divides. Second, we obtained a state-level variable measuring the number of deaths that can be attributed to lightning strikes. Extensive previous research demonstrates that technology adoption is slower and digital connectivity weaker in areas where strikes are more frequent (Manacorda & Tesei, 2020; Pesando, 2022; Rotondi et al., 2020; Varriale et al., 2022), likely because of damaged antennas on the ground (negative *first-stage* coefficient). Relatedly, deaths from lightning strikes in a specific state are unlikely to have any independent relationship with traditional vs modern partnership ideals. The benefit of using both IVs together is that a Sargan-Hansen statistic (J test) can be obtained. As the endogenous variable is binary and the outcome continuous, we adopt a simple two-stage least-squares (2SLS) approach (Angrist & Pischke, 2009). As these IVs only vary

across 20 cities or states, we restate that we treat this IV approach as a robustness check, calling for additional research on India exploiting real experimental variation in Internet diffusion – in a spirit similar to Hjort and Poulsen (2019) in Africa.

Descriptive Findings

Figure 1 estimates weighted proportions of responses for each of the six items of partnership ideals by level of exposure to the Internet. We do not observe marked patterns between Internet users and non-users in terms of the importance of prior acquaintance. In terms of parental approval, we observe that daily Internet users are least likely to consider parental approval as very important and most likely to consider parental approval as not important. Women who use the Internet every day, particularly those who access it from their own devices, mostly believe that finding a partner by themselves is the best way to arrange a partnership. A similar gradient – yet reversed – is observed for the response on parents as the main people responsible for arranging a partnership. Associations between Internet use and joint arrangements are weaker, though Internet users are slightly more likely to see "self + parents" as the optimal combination relative to non-users. Moving to the importance of partners' traits, Internet non-users are more likely to see caste as a very important factor to consider, while evidence on partner's education is more mixed. Lastly, we observe a very neat gradient for the love marriage question, whereby regular Internet users are significantly more likely to see love marriage as a perfectly acceptable arrangement for their children (and less likely to see love marriage as not a viable option).

[Figure 1 about here]

Figure 2 provides similar estimates, yet combining all categorical items dichotomized – following the process outlined in the previous section – into a score ranging from 0 to 6 where 0 corresponds to very traditional and 6 corresponds to very modern. This score is then broken into categories where 0 and 1 are coded as "Traditional," 2 and 3 are coded as "Hybrid," and 4, 5, and 6 are coded as "Modern." Descriptive findings confirm the above gradient: Internet non-users are significantly more likely to hold traditional ideals, while Internet users through own device are significantly more likely to hold modern ideals, followed by Internet users through shared device and non-users, respectively. Conversely, associations between Internet use and hybrid partnership ideals are less clear-cut. Thus, descriptive evidence provides *prima facie* confirmation that our hypotheses may be valid: there is a positive association between regular Internet use and modern partnership ideals, and shared device use is less strongly associated with modern partnership ideals relative to independent device use. Results reported using an alternative process to categorize ideals are virtually unchanged and reported in Appendix Figure A3.

[Figure 2 about here]

Despite our effort to categorize and "group" ideals, we also document within-individual variation whereby partnership ideals may be very mixed for each respondent. In other words, it is not the case that respondents exhibiting secularized ideals in terms of partner's education necessarily hold secularized ideals in terms of

allowing love marriage for their children. Similarly, respondents answering that caste is not an important trait for partner selection may be answering that parents alone are those best positioned to pick a partner. This is very clearly shown through three sample cross-tabulations reported in Table 2. Giving some examples, out of all respondents answering that partner's education is very important, 18.6% would not allow their children to do love marriage (panel a). Out of all respondents answering that partner's caste is not important, 18.6% and 39.6% consider, respectively, parents alone and parents with children the best people to select a partner (panel b). Not least, out of all women reporting that parental approval is very important, 20.9% would select their partner alone (panel c). In this sense, our data corroborate the idea of a slowly modernizing society in the realm of the family in which both modern and traditional beliefs and practices coexist in a "hybridized" fashion (Allendorf & Pandian, 2016; Reed, 2022).

[Table 2 about here]

Results

Main Findings

Table 3 provides main results from OLS models predicting partnership ideals as continuous index. Four models are presented, with the last (4) including all controls. Few general findings emerge. First, while there is a strong positive bivariate association between daily Internet exposure and modern partnership ideals, this disappears as soon as individual-level controls are introduced. The same does not apply

when focusing on daily Internet exposure through own device. In this case, associations remain strong and significant after accounting for individual-, city-, and state-level controls, declining from 0.267 (model 1) to 0.195 (model 4). This estimate suggests that being exposed to the Internet daily through own device is associated with an increase in the partnership index by close to 0.2 units. Out of a sample mean of 2.65 for women with no daily Internet exposure, this corresponds to a 7.4% increase. Second, education is positively associated with modern partnership ideals, albeit with some non-linearities. While women with university education are significantly more likely to hold modern ideals relative to primary-educated, the same does not hold for women with secondary education, whose likelihood is significantly lower. Geographically, we observe significantly more modern ideals in the Northeast (relative to North) and significantly less modern ideals in the South. While we observe no heterogeneity by caste group, heterogeneity by religion reveals that Muslim hold significantly more traditional ideals (relative to Hindu). Third, geographic contextual variables hold strong predictive power, although again with important exceptions and non-linearities.

[Table 3 about here]

Additional full-specification models on each dichotomized item making up the continuous index are reported in Figure A4. These confirm much stronger predictive power of the daily Internet exposure through own device variable, showcasing that associations are positive across all items except for the importance of education (IMP-E). Strongest results are observed for the importance of prior acquaintance (IMP-A) and for love marriage among children (LOV-C), followed closely by best people to find

a partner (BES-P) and the importance of caste (IMP-C). Furthermore, Figure 3 summarizes results plotting predicted probabilities from multinomial logistic regressions predicting belonging to the three partnership categories visualized in Figure 2, namely traditional, hybrid, and modern. Results confirm that most variation is driven by using the Internet daily through own device, and that modern and hybrid ideals are more responsive to Internet exposure. Results reported using an alternative process to categorize ideals are virtually unchanged and reported in Appendix Figure A5. All in all, evidence from Table 3 and Figure 3 supports hypotheses 1 and 2: daily Internet exposure is positively and significantly associated with modern partnership ideals, yet this is only the case when the Internet is accessed independently.

[Figure 3 about here]

To conclude, Figure 4 plots linear combinations from interaction terms between Internet exposure (daily Internet use, top panel; daily Internet use through own device, bottom panel) and respondents' levels of education. The top panel shows a neat gradient whereby estimates are bigger and bigger the higher the level of education. Conversely, the bottom panel shows some non-linearities whereby estimates are biggest in magnitude for secondary and higher secondary education (and statistically different from primary education, as confidence intervals do not overlap), yet they get closer to zero for university education. Among women with secondary and higher secondary education, using Internet daily through own device is associated with a significant increase in the partnership index by 0.639 and 0.334 units, respectively – an effect size which is two to three times bigger relative to the all-sample one (0.195).

Consistent across panels, the estimated association between Internet exposure and modern partnership ideals is negative for women with primary education and positive for all other educational groups. These findings confirm our hypothesis 3 postulating that, when combined with higher education levels, Internet exposure is more strongly associated with modern partnership ideals than education or Internet alone. As this finding is primarily confirmed using the Internet use on own device variable, we see this finding as also suggestive of access-based and skill-based digital divides whereby low-educated women have neither access to digital technologies nor the adequate skills to leverage their potential and reap benefits from them.

[Figure 4 about here]

Robustness Checks

Missing Data and Attrition Analyses

In Table A2 we report attrition analyses exploring whether women with (153) and without (1,798) missing information differ significantly in terms of key variables of interest, i.e., partnership ideals and Internet exposure. Results are very clear: the women we lose have, on average, more modern ideals (3.098 vs 2.752 on the continuous index) and are significantly more likely to access Internet daily on their own devices relative to non-missing women (0.730 vs 0.500), while differences on daily Internet use are not statistically significant. Looking at sub-categories, results confirm that missing women hold less traditional ideals (0.078 vs 0.118), less hybrid ideals (0.184 vs 0.269), and more modern ideals (0.737 vs 0.613). As such, we are losing relatively advantaged

women for whom the association between Internet exposure and partnership ideals may be even stronger, i.e., our findings may be seen as conservative.

Nonetheless, to make sure our results are not driven by missing data, we rerun estimates by means of multiple imputation with chained equations, imputing missing data on education, caste, region, and religion. Table A3 shows results from full specifications with and without multiple imputations. Results are essentially unchanged: the association between daily Internet use and modern partnership ideals is positive but not significant (0.162 vs 0.128 without imputation), while the association between daily Internet use through own device and modern partnership ideals is positive and strongly statistically significant (0.191 vs 0.195 without imputation).

Instrumental-Variable (IV) Estimates

We conclude this study by providing IV estimates on the relationship of interest, using the city-level and state-level IVs presented above (Table 4). We limit these analyses to one Internet predictor only, i.e., accessing Internet daily through own device vs not. This is sensible considering our findings so far, yet it is also justified by the fact that the first stage does not hold for the other predictor, i.e., city- and state-level variables do not predict strong enough variation in daily Internet use. Considering that close to 90% of women use Internet daily (vs 51% using it through own device) and that first-stage variation comes from 20 geographical units only, this is not surprising. To avoid any collinearity with download speed, note that the number of mobile networks previously used as city-level control is omitted from these analyses.

[Table 4 about here]

The Table reports both first-stage (bottom panel) and second-stage estimates (top panel). Starting from the former, associations are significant and in line with our theoretical expectations: the speed of download is positively associated with daily Internet use on own device, and deaths from lightning strikes are negatively associated with Internet exposure, likely due to poorer connectivity driven by damaged ground infrastructure. The two remain highly significant when used in a joint model, with an F statistic well above conventional thresholds for significance (F=37.2). Moving to the second stage, results confirm that daily Internet exposure through own device is positively and significantly associated with modern partnership ideals irrespective of specification. Most importantly, specifications with both city- and state-level IVs suggest that there is not enough evidence (p>.10) to reject the null hypothesis that the instruments are orthogonal to the second-stage disturbance term, strengthening confidence in the validity of the chosen instruments. The combined model reveals that using Internet daily through own device is associated with an increase in the partnership index by 1.3 units (corresponding to an increase of about 50% on the mean). This effect size is close to six times as big as the OLS one, which is often the case when using IVs, mostly due to omitted variable biasing OLS estimates downward, alongside concerns related to measurement errors, validity of the instruments, etc. As such, while this finding provides suggestive evidence that the association under investigation may be deemed causal, we defer more conclusive causal statements to future experimental studies.

Conclusions and Discussion

Building on the premise that Internet diffusion may shape family-related outcomes such as views and opinions regarding different aspects of family by means of exposure through globalized cultural scripts, this study has advanced scholarship in family sociology and digital demography by showing that this is indeed the case among unmarried women in urban India. Leveraging a new data source including detailed questions on partnership ideals as well as information on Internet exposure through own vs shared devices, we have found that recurrent use of the Internet is associated with a significant increase in modern partnership ideals measured as secularized views on the choice of a partner, the importance of marriage, partner preferences, and views about love marriage. Moreover, we have showed that accessing the Internet independently – vis-à-vis through a shared device – is what matters the most, and that results are stronger among high-educated respondents, particularly women with secondary and higher secondary education.

Our findings are new in the context of India. While previous scholarship on LMICs had documented the implications of the "digital revolution" for sociodemographic outcomes such as fertility, divorce, marriage, contraceptive use, etc. (Pesando, 2022; Pesando et al., 2021; Rotondi et al., 2020; Toffolutti et al., 2020; Zheng et al., 2019), this is – to the best of our knowledge – the first study to do so in India, currently the biggest demographic player of the globe. Assessing the implications of the digital revolution for Indian women is an essential endeavor for multiple reasons, including the recent massive increase in Internet penetration in the country, the

persistent – yet narrowing – digital gender divide that still puts women at significant disadvantage, especially when it comes to platform use, social media access, and digital skills (Galpaya et al., 2023), and the extensive sociological debate on the role of modernization forces in shaping family dynamics in India (Allendorf & Thornton, 2015; Breton, 2019, 2021).

Our findings corroborate the idea that modernization cannot be observed across all family domains and that respondents often showcase modern ideals in some domains (e.g., importance of caste), yet not in other (e.g., parental approval). As such, our findings align with previous literature suggesting that individuals are moving more and more towards hybridized family arrangements and mate-selection processes (Allendorf & Pandian, 2016; Sarkar & Rizzi, 2024). Nonetheless, our results also enrich this scholarship by unraveling that digital technologies hold an important role, and one that may have been neglected in previous discussions on family change in India. We provide solid evidence that digital technologies may be gradually contributing to shifting views about marriage and family formation, even in a context such as India which has traditionally exhibited strong resistance to modernization forces, thus calling for more research on the digital revolution in India. In saying so, we believe that focusing on partnership ideals provides yet another novel contribution when studying modernization processes in India, given their potentially more reactive nature to globalized scripts vis-à-vis actual behavior (Pierotti, 2013; Varriale et al., 2022). Open questions remain on the extent to which these "modernizing" partnership ideals would reflect, at a later stage, onto significant changes in partnership behavior,

as well as significant transformations in family forms and structures, such as the decline in parental authority and/or arranged marriage.

Our findings are also highly policy relevant in at least two domains. The first one relates to ensuring that individuals not only have access to technologies, but can do so independently of potential partners, peers, or other household members. Independent access and use of technology is far more strongly associated with modern partnership ideals relative to shared one, likely due to the ability to access personalized content on a regular basis (e.g., accessing social media, reading news, exchanging information with peers, etc.), as well as broader control, agency, and empowerment tied to – as well as independent of – technology use. As such, continuous policy efforts towards lowering the cost of technology (such as smartphones or personal computers), as well as the cost of data plans enabling Internet access hold huge potential to the extent that they allow more and more individuals to *independently* access globalized cultural scripts and discourses that they can select themselves in full autonomy. The second policy area refers to *first-level* (access) and *second-level* (skills) digital divides. Albeit indirectly, our results on shared vs own device use, alongside far stronger results among educated women (and negative ones among uneducated ones), provide evidence in support of both, calling for policymakers, including local governments and communities, to complement the cost-related efforts mentioned above with investments in digital-skill training since early ages. In other words, for these positive associations to translate into actual policy recommendations, a more elaborate infrastructural overhaul would be needed to sustain a population's access to charged

smartphones or laptops, alongside broader investments in cheaper, equitable access to technology enabling independent use and ICT skill development, especially among women.

As the first of its kind, this study has some limitations that pave the way for additional research on the topic. First is the nature of the data. Despite rich in terms of variables, this dataset is limited to unmarried partnered women in urban areas. We have made efforts to reweight the data to make them closer to nationally representative, yet similar analyses can be replicated using nationally representative data covering both partnered and unpartnered women, as well as rural and urban areas. The DHS would be a good candidate for this analysis, yet they don't include (yet) detailed information on Internet use and own vs shared device use. Second, readers may be skeptical that Internet diffusion might simply be another proxy for progress in socioeconomic development and, as such, Internet estimates would capture the relationship between socioeconomic progress and modern partnership ideals, suggesting more modern ideals where socioeconomic progress is higher. We considered this issue by controlling for a broad range of individual-, city-, and state-level characteristics related to socioeconomic status – from educational attainment to electricity in the city and share of households with working Internet connection in the state. Controlling for these factors does not change the main results, yet we acknowledge that there may be other important observed factors we are not accounting for.

Relatedly, scholars and policymakers interested in the topic might worry that, alongside other observed factors omitted from our models, unobserved factors (e.g., personality differences) might influence both Internet use and partnership ideals, thus raising concerns on the interpretation of the estimates as causal. This is a valid concern that is hard to tackle fully when working with cross-sectional data in the absence of experimental variation. We did our best to combine different approaches to test for unobserved factors driving potential endogeneity. Although IV estimates might reflect measurement error in the Internet predictor or validity concerns related to the instruments themselves, the sign of the estimated coefficients is in line with OLS results, corroborating the presence of a positive association between exposure to the Internet and partnership ideals. The consistency of the findings may hint at the causal nature of the estimates, yet we prefer to shy away from thorough discussions of causality, as we see this work as valuable beyond the interpretation of the estimates as causal. Still, experimental approaches to these questions could further strengthen our findings.

References

Agarwal Goel, P., & Barua, R. (2023). Female education, marital assortative mating, and dowry: Theory and evidence from districts of India. *Journal of Demographic Economics*, *89*(2), 183–209.

Agrawal, A. (2015). Cyber-matchmaking among Indians: Re-arranging marriage and doing 'kin work.' *South Asian Popular Culture*, *13*(1), 15–30.

Aiken, E. L., Thakur, V., & Blumenstock, J. E. (2022). Phone Sharing and Cash Transfers in Togo: Quantitative Evidence from Mobile Phone Data. *ACM International Conference Proceeding Series*, *Par F18047*, 214–231.

Aker, J. C., & Mbiti, I. M. (2010). Mobile phones and economic development in Africa. *Journal of Economic Perspectives*, *24*(3), 207–232.

Allendorf, K. (2013). Schemas of marital change: From arranged marriages to eloping for love. *Journal of Marriage and Family*, *75*(2), 453–469.

Allendorf, K., & Pandian, R. K. (2016). The Decline of Arranged Marriage? Marital Change and Continuity in India. *Population and Development Review*, *42*(3), 435–464.

Allendorf, K., & Thornton, A. (2015). Caste and choice: The influence of developmental idealism on marriage behavior. *American Journal of Sociology*, *121*(1), 243–287.

Allendorf, K., Thornton, A., Mitchell, C., & Young-DeMarco, L. (2019). The Influence of Developmental Idealism on Marital Attitudes, Expectations, and Timing. *Journal of Family Issues*, *40*(17), 2359–2388.

Angrist, J. D., & Pischke, J.-S. (2009). *Mostly Harmless Econometrics: An Empiricist's Companion*. Princeton University Press.

Appadurai, A. (1996). *Modernity at large: Cultural dimensions of globalization*. University of

Minnesota Press.

Asher, S., Lunt, T., Matsuura, R., & Novosad, P. (2021). Development Research at High Geographic Resolution: An Analysis of Night-Lights, Firms, and Poverty in India Using the SHRUG Open Data Platform. *World Bank Economic Review*, *35*(4), 845–871.

Azur, M. J., Stuart, E. A., Frangakis, C., & Leaf, P. J. (2011). Multiple imputation by chained equations: what is it and how does it work? *International Journal of Methods in Psychiatric Research*, *20*(1), 40–49.

Banerjee, A., La Ferrara, E., & Orozco, V. (2019). Entertainment, Education, and Attitudes Towards Domestic Violence. *AEA Papers and Proceedings*, *109*, 133–137.

Bhandari, P. (2020). *Matchmaking in Middle Class India: Beyond Arranged and Love Marriage*. Springer.

Billari, F. C., Giuntella, O., & Stella, L. (2019). Does broadband Internet affect fertility? *Population Studies*, *73*(3), 297–316.

Billari, F. C., Rotondi, V., & Trinitapoli, J. (2020). Mobile phones, digital inequality, and fertility: Longitudinal evidence from Malawi. *Demographic Research*, *42*(June), 1057–1096.

Breton, E. (2019). Modernization and Household Composition in India, 1983–2009. *Population and Development Review*, *45*(4), 739–766.

Breton, E. (2021). Modernisation, demographic change and state-level variations in household composition in India. *Asian Population Studies*, *17*(3), 225–249.

Bruederle, A., & Hodler, R. (2018). Nighttime lights as a proxy for human development at the local level. *PLoS ONE*, *13*(9), 1–22.

Chakraborty, D. (2019). Components Affecting Intention to Use Online Dating Apps in India:

A Study Conducted on Smartphone Users. *Asia-Pacific Journal of Management Research and Innovation*, *15*(3), 87–96.

Chakraborty, K. (2012). Virtual mate-seeking in the urban slums of Kolkata, India. *South Asian Popular Culture*, *10*(2), 197–216.

Chakravorty, S., Goli, S., & James, K. S. (2021). Family Demography in India: Emerging Patterns and Its Challenges. *SAGE Open*, *11*(2).

Chen, X., & Nordhaus, W. D. (2011). Using luminosity data as a proxy for economic statistics. *Proceedings of the National Academy of Sciences of the United States of America*, *108*(21), 8589–8594.

Cherlin, A. J. (2012). Goode's World Revolution and Family Patterns: A reconsideration at fifty years. *Population and Development Review*, *38*(4), 577–607.

Desai, S., & Andrist, L. (2010). Gender scripts and age at marriage in India. *Demography*, *47*(3), 667–687.

Dommaraju, P. (2016). Divorce and separation in India. *Population and Development Review*, *42*(2), 195–223.

Durante, R., Pinotti, P., & Tesei, A. (2019). The political legacy of entertainment TV. *American Economic Review*, *109*(7), 2497–2530.

Dyson, T., Cassen, R., & Visaria, L. (2004). *Twenty-first century India: population, economy, human development, and the environment*. Oxford University Press.

Galpaya, H., Hurulle, G., Amarasinghe, T., & Bamaramannage, S. (2023). *Digital platforms in Asia: Access and Use*. *April*.

Goode, W. J. (1963). World Revolution and Family Patterns. In *New York: Free Press of Glencoe* (Vol. 62). New York: Free Press of Glencoe.

GSMA. (2020). *Connected Women: The Mobile Gender Gap Report 2020*. https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2019/03/GSMA-Connected-Women-The-Mobile-Gender-Gap-Report-2019.pdf

GSMA. (2021). *The mobile economy report: Asia Pacific*. 1–73. http://www.gsmamobileeconomy.com/

Hjort, J., & Poulsen, J. (2019). The arrival of fast internet and employment in Africa. *American Economic Review*, *109*(3), 1032–1079.

James, J. (2011). Sharing mobile phones in developing countries: Implications for the digital divide. *Technological Forecasting and Social Change*, *78*(4), 729–735.

Johnson-Hanks, J. a., Bachrach, C. a., Morgan, S. P., & Kohler, H.-P. (2011). Chapter 1: The Theory of Conjunctural Action. In *Understanding Family Change and Variation* (pp. 111–136).

Kantar. (2021). Internet Adoption in India, ICUBE 2020. *Kantar*, *June*, 1–22. https://cms.iamai.in/Content/MediaFiles/7d9fac50-7cac-43df-93c9-0cf34fb52403.pdf

Kearney, M. S., & Levine, P. B. (2015). Media influences on social outcomes: The impact of MTV's 16 and pregnant on teen childbearing. *American Economic Review*, *105*(12), 3597–3632.

Kohli, A. (2018). Son Preference among the Educated Urban Middle-class in North India. *Journal of Cultural Analysis and Social Change*, *3*(1), 1–12.

Kreager, D. A., Cavanagh, S. E., Yen, J., & Yu, M. (2014). "Where have all the good men gone?" Gendered interactions in online dating. *Journal of Marriage and Family*, *76*(2), 387–410.

Kumari, N., & Shekhar, C. (2023). Trend and determinants of early marriage in Rajasthan:

Evidence from the national family health survey. *Children and Youth Services Review*, *145*(December 2022), 106746.

La Ferrara, E. (2016). Mass media and social change: Can we use television to fight poverty? *Journal of the European Economic Association*, *14*(4), 791–827.

La Ferrara, E., Chong, A., & Duryea, S. (2012). Soap operas and fertility: Evidence from Brazil. *American Economic Journal: Applied Economics*, *4*(4), 1–31.

Lai, Q., & Thornton, A. (2015). The making of family values: Developmental idealism in Gansu, China. *Social Science Research*, *51*, 174–188.

Manacorda, M., & Tesei, A. (2020). Liberation Technology: Mobile Phones and Political Mobilization in Africa. *Econometrica*, *88*(2), 533–567.

Masika, R., & Bailur, S. (2015). Negotiating Women's Agency through ICTs: A Comparative Study of Uganda and India. *Gender, Technology and Development*, *19*(1), 43–69.

Meyer, J. W., Boli, J., Thomas, G. M., & Ramirez, F. O. (1997). World society and the nation-state. *American Journal of Sociology*, *103*(1), 144–181.

Munshi, S. (2017). Arranged marriage, education, and dowry: A contract-theoretic perspective. *Journal of Economic Development*, *42*(1), 35–71.

Narzary, P. K., & Ladusingh, L. (2019). Discovering the Saga of Inter-caste Marriage in India. *Journal of Asian and African Studies*, *54*(4), 588–599.

Netting, N. S. (2010). Marital ideoscapes in 21st-century India: Creative combinations of love and responsibility. *Journal of Family Issues*, *31*(6), 707–726.

Ong, D., & Wang, J. (2015). Income attraction: An online dating field experiment. *Journal of Economic Behavior and Organization*, *111*, 13–22.

Patel, R., & Parmentier, M. J. C. (2005). The Persistence of Traditional Gender Roles in the

Information Technology Sector: A Study of Female Engineers in India. *Information Technologies and International Development*, *2*(3), 29–46.

Pérez-Sindín, X. S., Chen, T. H. K., & Prishchepov, A. V. (2021). Are night-time lights a good proxy of economic activity in rural areas in middle and low-income countries? Examining the empirical evidence from Colombia. *Remote Sensing Applications: Society and Environment*, *24*(May).

Pesando, L. M. (2022). Safer if Connected? Mobile Technology and Intimate Partner Violence. *Demography*, *59*(2), 653–684.

Pesando, L. M., Rotondi, V., Stranges, M., Kashyap, R., & Billari, F. C. (2021). The Internetization of international migration. *Population and Development Review*, *47*(1), 79–111.

Pierotti, R. S. (2013). Increasing Rejection of Intimate Partner Violence: Evidence of Global Cultural Diffusion. *American Sociological Review*, *78*(2), 240–265.

Potarca, G. (2017). Does the internet affect assortative mating? Evidence from the U.S. and Germany. *Social Science Research*, *61*, 278–297.

Potarca, G. (2020). The demography of swiping right. An overview of couples who met through dating apps in Switzerland. *PLoS ONE*, *15*(12 December), 1–22.

Potarca, G. (2021). Online dating is shifting educational inequalities in marriage formation in Germany. *Demography*, *58*(5), 1977–2007.

Reed, M. (2022). Marriage and Family in India, Doctoral dissertation, University of Pennsylvania.

Qian, Y., & Hu, Y. (2024). How couples meet and assortative mating in Canada. *Journal of Marriage and Family*, *June 2023*, 1–16.

Qian, Y., Shen, Y., & Cai, M. (2022). Gendered age preferences for potential partners: a mixed-methods study among online daters in Shanghai. *Chinese Sociological Review*, *54*(3), 304–331.

Ram, B. (2012). Fertility decline and family change in India: A demographic perspective. *Journal of Comparative Family Studies*, *43*(1), 11–40.

Rammohan, A., & Vu, P. (2018). Gender Inequality in Education and Kinship Norms in India. *Feminist Economics*, *24*(1), 142–167.

Ray, T., Roy Chaudhuri, A., & Sahai, K. (2020). Whose Education Matters? An Analysis of Inter Caste Marriages in India. *Journal of Economic Behavior and Organization*, *176*, 619–633.

Rosenfeld, M. J. (2017). Marriage, choice, and couplehood in the age of the internet. *Sociological Science*, *4*, 490–510.

Rosenfeld, M. J., Thomas, R. J., & Hausen, S. (2019). Disintermediating your friends: How online dating in the United States displaces other ways of meeting. *Proceedings of the National Academy of Sciences of the United States of America*, *116*(36), 17753–17758.

Rotondi, V., Kashyap, R., Pesando, L. M., Spinelli, S., & Billari, F. C. (2020). Leveraging mobile phones to attain sustainable development. *Proceedings of the National Academy of the Sciences*, *117*(24), 13413–13420.

Samanta, T., & Varghese, S. S. (2019). Love in the Time of Aging: Sociological Reflections on Marriage, Gender and Intimacy in India. *Ageing International*, *44*(1), 57–73.

Sarkar, K. (2022). Can Status Exchanges Explain Educational Hypogamy in India? *Demographic Research*, *46*(May), 809–847.

Sarkar, K., & Rizzi, E. L. (2024). Self-Arranged Marriages in India: Change Amidst

Sociocultural Underpinnings and Hanging Norms. *Marriage and Family Review*, *60*(2), 76–108.

Singh, M., Shekhar, C., & Shri, N. (2023). Patterns in Age at First Marriage and Its Determinants in India: A Historical Perspective of Last 30 Years (1992–2021). *SSM - Population Health*, *22*(February), 101363.

Szreter, S. (2015). Populations for Studying the Causes of Britain's Fertility Decline communication communities. *Population in the Human Sciences: Concepts, Models, Evidence*.

Thornton, A. (2001). The developmental paradigm, reading history sideways, and family change. *Demography*, *38*(4), 449–465.

Thornton, A., Binstock, G., Yount, K. M., Abbasi-Shavazi, M. J., Ghimire, D., & Xie, Y. (2012). International Fertility Change: New Data and Insights From the Developmental Idealism Framework. *Demography*, *49*(2), 677–698.

Toffolutti, V., Ma, H., Menichelli, G., Berlot, E., Mencarini, L., & Aassve, A. (2020). How the internet increases modern contraception uptake: Evidence from eight sub-Saharan African countries. *BMJ Global Health*, *5*(11), 1–10.

Trinh, T. A., & Zhang, Q. (2021). Adverse shocks, household expenditure and child marriage: evidence from India and Vietnam. *Empirical Economics*, *61*(3), 1617–1639.

UN-DESA. (2023). India Overtakes China as the World's Most Populous Country. *Future of the World, Policy Brief No. 153*, 1–5.

Varriale, C., Pesando, L. M., Kashyap, R., & Rotondi, V. (2022). Mobile Phones and Attitudes Towards Women's Participation in Politics: Evidence from Africa. *Sociology of Development*, *8*(1), 1–37.

Visaria, L. (2022). India's date with second demographic transition. *China Population and Development Studies*, *6*(3), 316–337.

Westoff, C. F., & Koffman, D. A. (2011). The association of television and radio with reproductive behavior. *Population and Development Review*, *37*(4), 749–759.

White, I. R., Royston, P., & Wood, A. M. (2011). Multiple imputation using chained equations: Issues and guidance for practice. *Statistics in Medicine*, *30*(4), 377–399.

Zheng, S., Duan, Y., & Ward, M. R. (2019). The effect of broadband internet on divorce in China. *Technological Forecasting and Social Change*, *139*(May 2017), 99–114.

Tables

Table 1: Descriptive statistics on key variables, analytical sample

	Mean or %
Internet exposure	
Using Internet daily	0.874
Using Internet daily on own device	0.507
Partnership ideals (items)	
Importance of prior acquaintance (IMP-A)	
Very	75.8
Moderately	16.6
Not	7.60
Importance of parental approval (IMP-P)	
Very	82.4
Moderately	14.7
Not	2.89
Best people for partner arrangement (BES-P)	
Self	22.8
Parents	32.3
Self + parents	32.9
Other	12.0
Importance of partner's education (IMP-E)	
Very	71.8
Moderately	19.6
Not	8.59
Importance of partner's caste (IMP-C)	
Very	51.6
Moderately	20.2
Not	28.2
Allow love marriage for children (LOV-C)	
Not	19.5
Maybe	10.7
Yes	69.8
Controls	
Age	24.33
Education	
Primary	4.89
Secondary	19.2
Higher secondary	38.9
University	37.0
Region	
North	35.4
Northeast	10.6
Central	16.6
West	11.2
East	5.56
South	20.6
Caste	
General	32.7
OBC	29.5
SC	25.6
ST	12.2
Religion	
Hindu	83.0
Muslim	5.17
Christian	6.56
Other	5.28
Geographic variables	
City-level	
Light intensity (per 1,000 people)	94.58
Household electricity (% households)	86.95
3G, 4G, 5G mobile networks	0.796
State-level	

	Average expenditure on data	0.651
	Share of HH with working Internet connection	0.210
IVs		
	Download speed, bitrates (city-level)	4.986
	Deaths from lightning strikes (state-level)	0.793

Note: Unweighted data. Analytical sample of 1,798 women. Geographic variables obtained from ancillary external sources: 3G, 4G, 5G mobile networks and download speed (bitrates) obtained from nPerf Speed Tests (2022). Household electricity obtained from the World Bank Spatial Database (2015). Average expenditure on data and share of HH with working Internet connection are obtained from the AfterAccess survey (2017). Deaths from lightning strikes obtained from the Earth Networks Total Lightning Network and Minister of State for Earth Sciences (2019/2020).

Table 2: Cross-tabulation of selected partnership ideal items

a.	**Importance of partner's education**			
Allow children to do love marriage	Very	Somewhat	Not	Total
No	18.6	23.3	17.9	19.5
Maybe	10.7	11.3	9.30	10.7
Yes	70.7	65.4	72.8	69.8
Total	100	100	100	100
b.	**Importance of partner's caste**			
Best people to find partner	Very	Somewhat	Not	Total
Self	19.8	18.7	29.9	22.4
Parents	42.5	25.7	18.6	32.4
Self+Parents	26.6	41.5	39.6	33.2
Other	11.1	14.1	11.9	12.0
Total	100	100	100	100
c.	**Importance of parental approval**			
Best people to find partner	Very	Somewhat	Not	Total
Self	20.9	29.7	43.1	22.9
Parents	35.5	16.8	21.6	32.3
Self+Parents	32.3	37.9	23.5	32.8
Other	11.3	15.6	11.8	12.0
Total	100	100	100	100

Note: Weighted data. Analytical sample of 1,798 women.

Table 3: Multivariate analyses predicting modern partnership ideals

Partnership ideals index (score, 6 items)	a. Daily Internet vs not				b. Daily Internet on own device vs not			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Internet exposure	0.457**	0.149	0.143	0.128	0.267**	0.101	0.173*	0.195*
	(0.110)	(0.122)	(0.121)	(0.121)	(0.078)	(0.080)	(0.080)	(0.081)
Age of the respondent		-0.018+	-0.014	-0.016		-0.019+	-0.015	-0.018+
		(0.010)	(0.010)	(0.010)		(0.010)	(0.010)	(0.010)
Respondent's education (Ref.: Primary)								
Secondary		-0.264	-0.327+	-0.359+		-0.233	-0.305	-0.344+
		(0.175)	(0.191)	(0.199)		(0.174)	(0.195)	(0.206)
Higher secondary		0.250	0.226	0.207		0.294+	0.248	0.216
		(0.165)	(0.178)	(0.185)		(0.156)	(0.176)	(0.187)
University		0.421*	0.402*	0.386*		0.468**	0.421*	0.389*
		(0.166)	(0.178)	(0.185)		(0.157)	(0.176)	(0.187)
Region (Ref.: North)								
Northeast		0.326*	0.453**	0.340*		0.344*	0.477**	0.355**
		(0.138)	(0.145)	(0.138)		(0.134)	(0.141)	(0.133)
Central		-0.288**	-0.089	-0.155		-0.296**	-0.095	-0.170
		(0.108)	(0.116)	(0.111)		(0.109)	(0.115)	(0.112)
West		-0.276*	-0.076	-0.106		-0.265*	-0.054	-0.073
		(0.129)	(0.134)	(0.145)		(0.130)	(0.136)	(0.147)
East		0.160	0.139	-0.154		0.171	0.112	-0.211
		(0.132)	(0.134)	(0.144)		(0.132)	(0.135)	(0.148)
South		-0.156	-0.164	-0.364**		-0.153	-0.176	-0.388**
		(0.107)	(0.119)	(0.125)		(0.106)	(0.119)	(0.125)
Respondent's caste group (Ref.: Gen)								
OBC		0.052	0.021	-0.014		0.073	0.049	0.017
		(0.103)	(0.103)	(0.105)		(0.104)	(0.103)	(0.105)
SC		0.171	0.101	0.089		0.175	0.105	0.095
		(0.109)	(0.110)	(0.109)		(0.109)	(0.110)	(0.110)
ST		0.134	0.083	0.061		0.151	0.106	0.087
		(0.133)	(0.137)	(0.134)		(0.132)	(0.134)	(0.131)
Respondent's religion (Ref.: Hindu)								
Muslim		-0.424*	-0.387*	-0.429*		-0.395*	-0.323+	-0.364+
		(0.186)	(0.189)	(0.194)		(0.183)	(0.185)	(0.190)
Christian		-0.105	-0.004	-0.135		-0.132	-0.045	-0.191
		(0.186)	(0.205)	(0.198)		(0.183)	(0.202)	(0.195)
Buddhist Jain Sikh		0.387	0.479+	0.546*		0.389	0.503*	0.579*
		(0.248)	(0.245)	(0.243)		(0.251)	(0.248)	(0.246)
Light intensity per 1000 people (city)			0.000	-0.000			0.000	-0.000
			(0.000)	(0.000)			(0.000)	(0.000)
% HH with access to electricity (city)			-0.013**	-0.013**			-0.015**	-0.016**
			(0.003)	(0.003)			(0.003)	(0.003)
3G, 4G, 5G cellular data networks (city)			0.096*	0.125**			0.107*	0.139**
			(0.043)	(0.042)			(0.042)	(0.042)
Average expenditure on data (state)				0.378**				0.400**
				(0.102)				(0.101)
Share hh with working Internet connection (state)				-1.053+				-1.241*
				(0.542)				(0.536)
Constant	2.379**	2.797**	3.649**	3.924**	2.655**	2.843**	3.898**	4.203**
	(0.102)	(0.286)	(0.383)	(0.382)	(0.059)	(0.283)	(0.372)	(0.374)
Observations	1,951	1,798	1,798	1,798	1,951	1,798	1,798	1,798

Note: Weighted data. Robust standard errors in parentheses.** p<0.01, * p<0.05, + p<0.1.

Table 4: Instrumental-Variable (IV) estimates on analytical sample

		Estimated coefficient on daily Internet use through own device		
IV 2SLS		**Download bitrates (city-level)**	**Deaths from lightning strikes (state-level)**	**Combined**
Partnership ideals index	Coef.	1.419*	1.134**	1.263**
	(SE)	(0.694)	(0.340)	(0.312)
	Obs.	1,798	1,798	1,798
	Hansen J. (p-value)	.	.	0.684
		First-stage estimates		
Download bitrates	Coef.	0.063**		0.039**
	(SE)	(0.016)		(0.005)
Deaths from lightning strikes	Coef.		-0.041**	-0.052**
	(SE)		(0.005)	(0.016)
All other controls		Yes	Yes	Yes
F stat.		13.9	65.1	37.2
Obs.		1,798	1,798	1,798

Note: Weighted data. Robust standard errors in parentheses. All controls from full specification included in both first and second stage (except number of mobile networks which is omitted altogether). ** p<0.01, * p<0.05, + p<0.1.

Figures

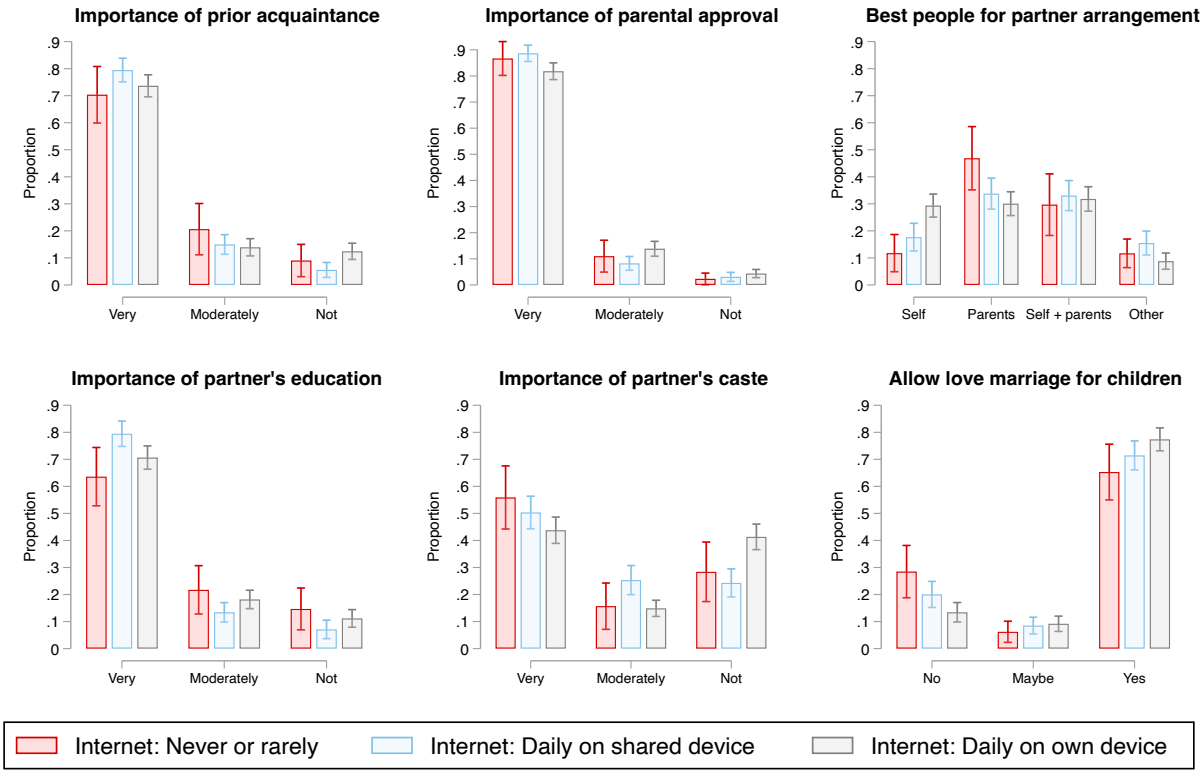

Figure 1: Partnership ideal variables by level of exposure to the Internet (proportions)

Notes: Weighted proportions. Analytical sample of 1,798 women.

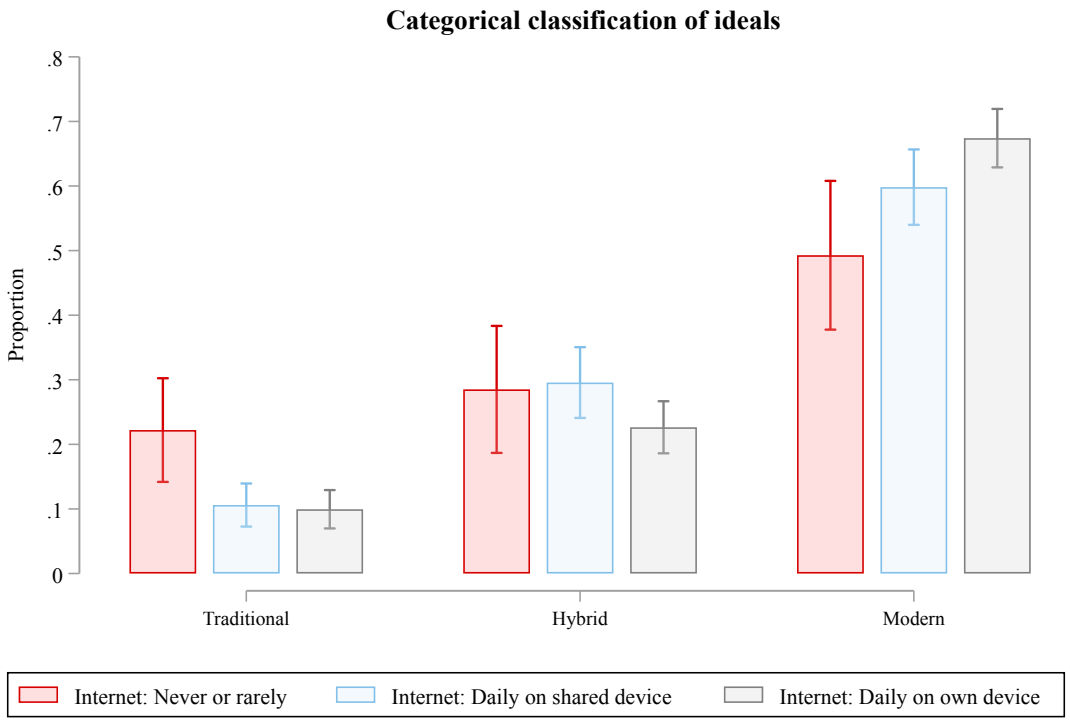

Figure 2: Partnership ideal index, broken down into categories, by level of exposure to the Internet (proportions)

Notes: Weighted proportions. Analytical sample of 1,798 women. Analogous estimates using an alternative classification of partnership ideals are reported in Figure A3.

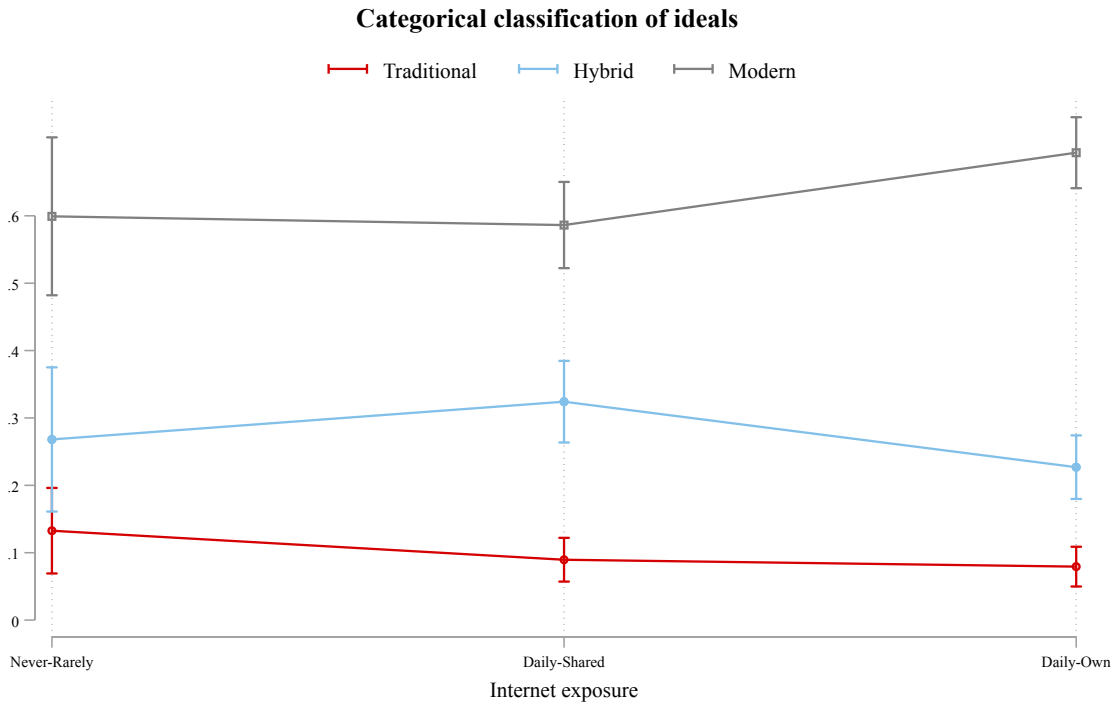

Figure 3: Predicted probabilities from multinomial logistic regression analyses predicting the partnership ideal index broken into the three macro-categories

Notes: Weighted estimates. Analytical sample of 1,798 women. All controls included. Analogous estimates using an alternative classification of partnership ideals are reported in Figure A5.

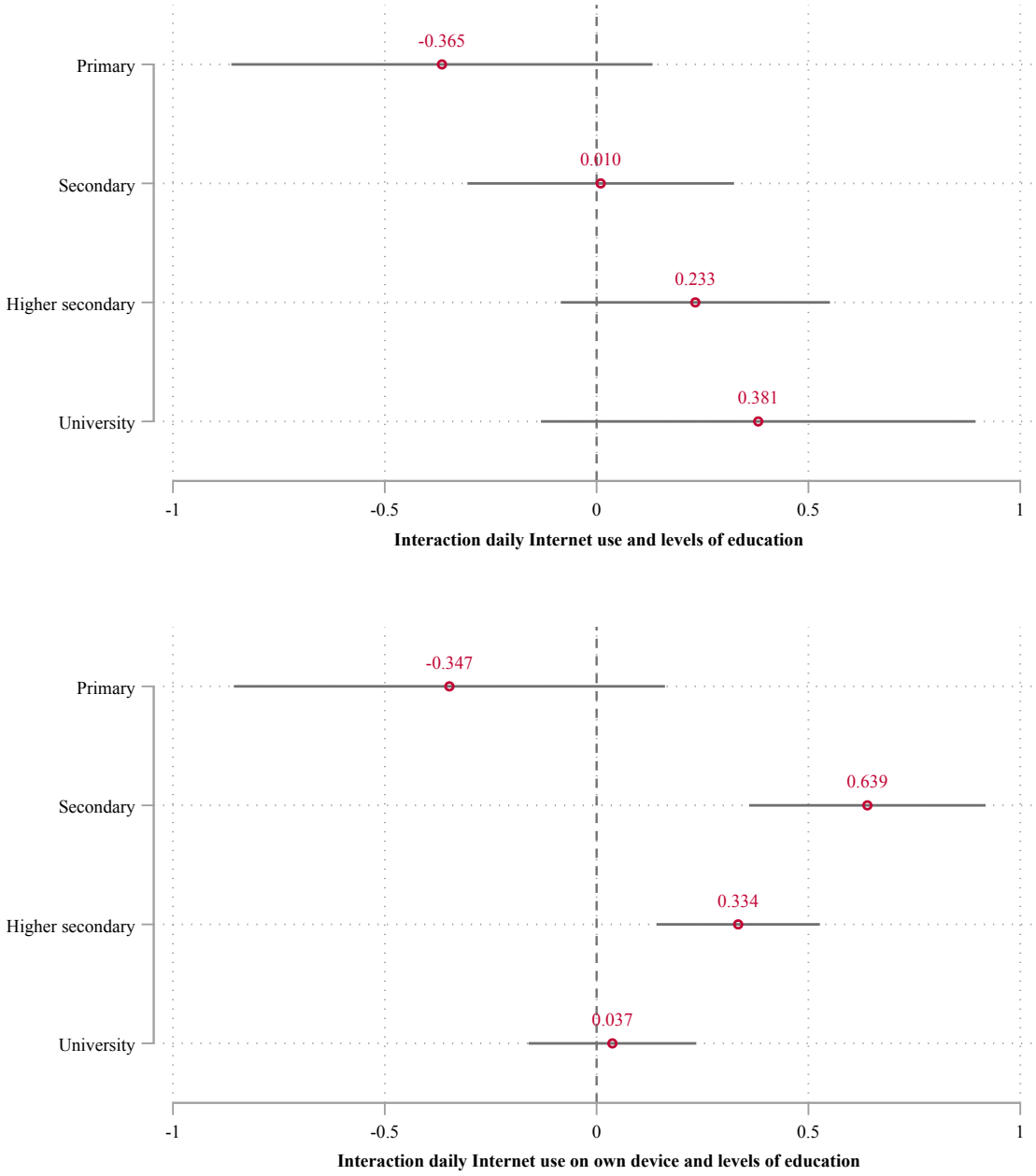

Figure 4: Interaction between Internet exposure and levels of education, linear combinations

Notes: Weighted estimates. Robust standard errors. Analytical sample of 1,798 women. 90% confidence intervals.

Appendix

Details on the dataset

Although we considered random sampling from voter rolls within each of these cities, we did not do so, largely because of concerns that door-to-door enumeration strategies would result in higher rates of refusal to participate than surveys conducted in public, particularly given the somewhat sensitive nature of the questions. This was of particular concern for questions about unmarried relationships, which may still not be accepted by young women's families, and conducting the survey at a home would mean that families would be present.

Details on geographical variables

We merged geographical variables at the level of cities and states obtained from a wide range of ancillary sources. We selected – as best as possible – estimates from the same year as the survey year (2021/2022). When this was not possible, we selected estimates from the closest possible year.

We obtained the number of 3G, 4G, 5G mobile networks from all carriers and download speed (bitrates) were obtained from nPerf Speed Tests (2021/2022/2023). The city-level number of networks (combining Airtel, BSNL, Jio, and Vi) is here built as the number in the city relative to the number in all India. The download speed bitrates variable measures the amount of video data being transferred in a particular amount of time. Example from Bengaluru, State of Karnataka available here: https://www.nperf.com/en/map/IN/1277333.Bengaluru/1991549.Airtel-Mobile/download/?ll=12.97194&lg=77.59369&zoom=12.

City-level household electricity and light intensity were obtained from the World Bank Spatial Database (2011) and updated through more recent estimates available through Visible and Infrared Imaging Suite (VIIRS) from the Earth Observation Group: https://eogdata.mines.edu/products/vnl/.

State-level average expenditure on data over the previous month and share of households with working Internet connection (phone or fibre/ADSL) were obtained from the AfterAccess survey (2017), conducted in multiple countries, including in India by LIRNEasia in 2017: https://lirneasia.net/after-access. These data are not publicly available; we got access to them following a specific data request.

Lastly, deaths from lightning strikes – which we built as the ratio of the number of deaths in the state relative to the number in all India – were obtained from the Earth Networks Total Lightning Network (2019) and updated through more recent estimates from the Ministry of Earth Sciences (2020). Links available here: https://get.earthnetworks.com/resources/reports/2019-india-lightning-report and https://pib.gov.in/Pressreleaseshare.aspx?PRID=1776751.

Alternative categorization of partnership ideals

There are several ways in which we could treat, categorize, and operationalize partnership ideals. In the main body of the paper, we rely on a series of categorical variables, we dichotomize them keeping as 1 responses that align with secularization, we create a partnership index ranging from 0-6, and then we create broad macro-categories based on the observed distribution (Traditional, Hybrid, Modern). Alternative ways could have included conducting cluster analysis on the six dummies, or latent class analysis. For the sake of space, we don't report all these alternative specifications, as results are largely consistent. We just report here in the Appendix one alternative strategy that makes use of additional information.

The alternative strategy proceeds as follows: we created not only six dummies that equal 1 if the specific item response aligns with "modern" or secularized behavior – then translated into a continuous score using row sum. We also created six dummies that equal 1 if the specific item response aligns with "hybrid" behavior, and other six dummies that equal 1 if the specific item response aligns with "traditional behavior." As such, we obtained three different continuous indices, one for modern ideals, one for hybrid ideals, and one for traditional ideals. We then created a new categorical

variable taking the value of "traditional" if the traditional continuous score takes the values 3/4/5/6 (i.e., the highest values); the value of "hybrid" if the hybrid continuous score takes the values 3/4/5/6 (i.e., the highest values); the value of "modern" if the modern continuous score takes the values 3/4/5/6 (i.e., the highest values). In so doing, the macro-categories ensuing from the continuous indices not only rely on one index, but on three different indices. Complementary figures reported in this Appendix (Figure A3 and A5) show that results are virtually unchanged.

Appendix Figures

Figure A1: Map of surveyed cities

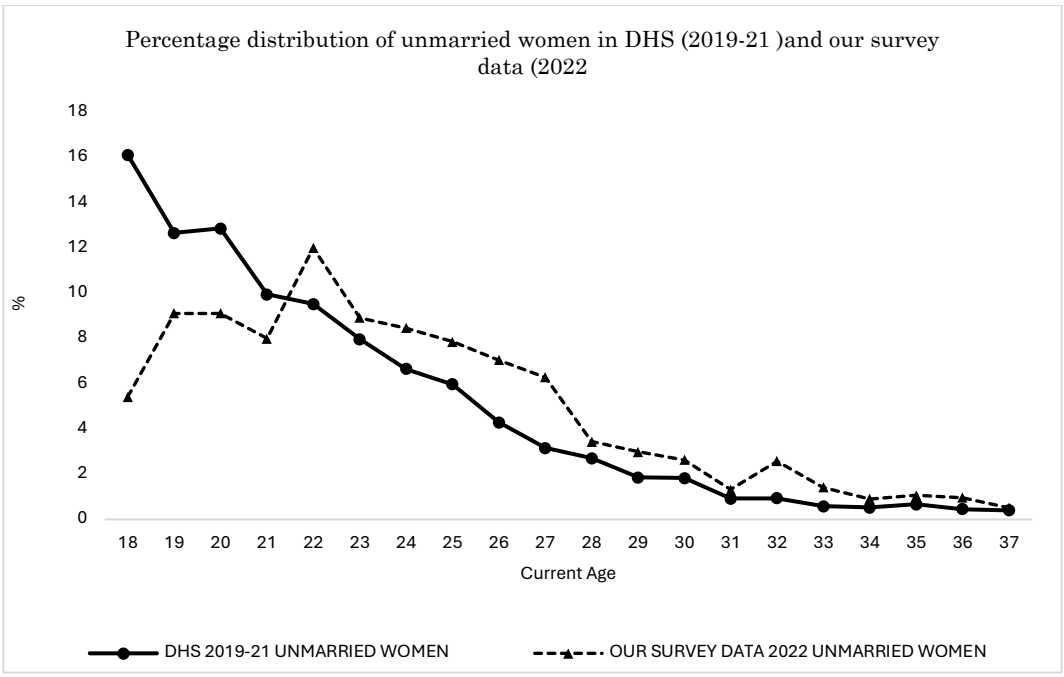

Figure A2: Age distribution of unmarried women in urban areas from DHS 2019-21 and our survey data 2022

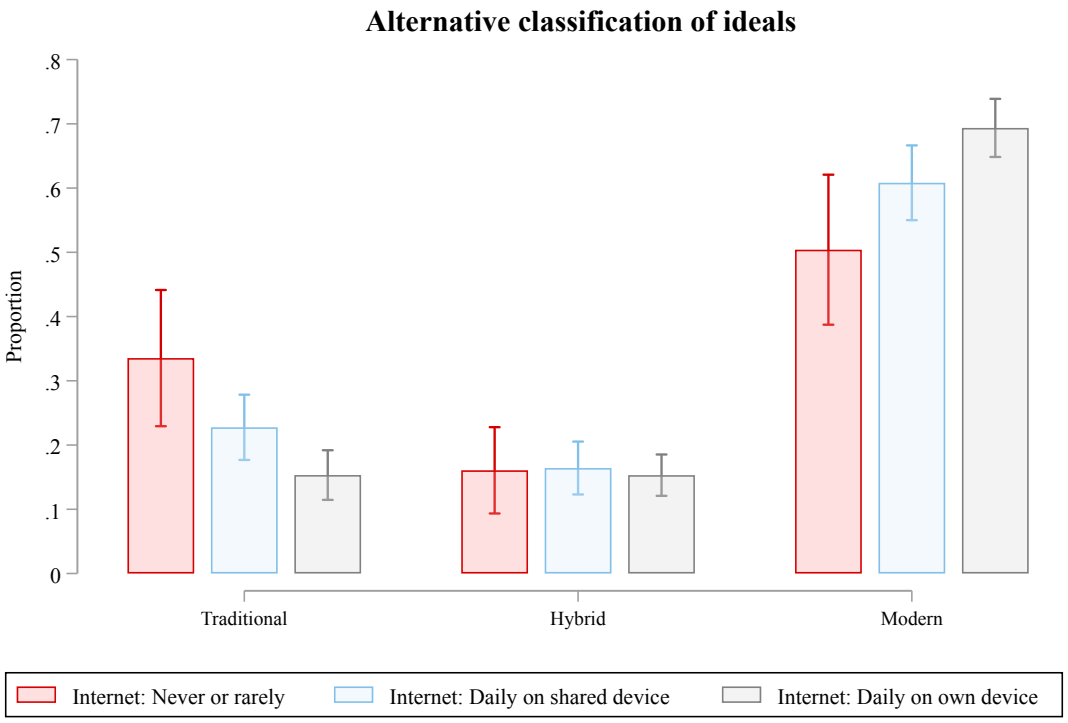

Figure A3: Alternative partnership ideal indices, broken down into categories, by level of exposure to the Internet (proportions)

Notes: Weighted proportions. Analytical sample of 1,798 women. This Figure is produced using an alternative process, to check for consistency. The alternative process is outlined above in the Appendix. Results are virtually unchanged with respect to those shown in Figure 2.

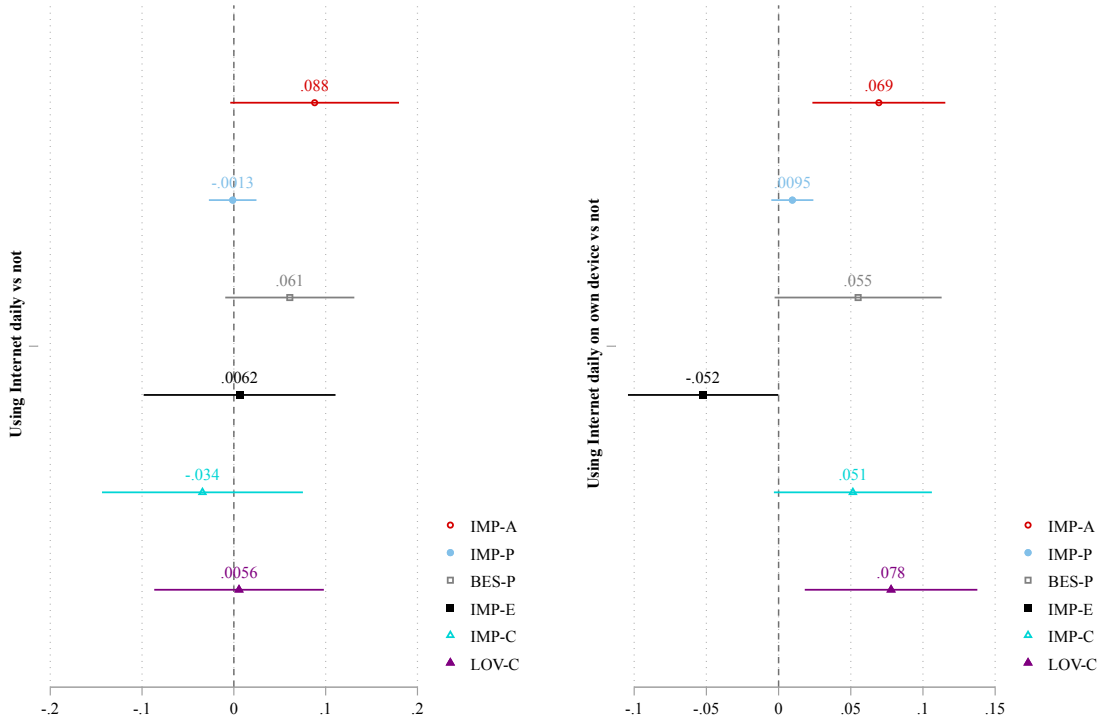

Figure A4: Multivariate analyses predicting each of the six dichotomized items making up the continuous index

Notes: Linear probability models, full specifications. Weighted data. Robust standard errors. Estimated coefficient on Internet variables reported. 90% confidence intervals reported. Original items: IMP-A: "How important is having prior acquaintance with the potential person you want to marry or have a relationship with?" IMP-P: "How important is receiving parental approval to start a relationship and/or enter a marriage?" BES-P: "Which of the following people do you think are best to find a partner or spouse?" IMP-E: "How important is the education level of the potential person you want to marry or have a relationship with?" IMP-C: "How important is the caste of the potential person you want to marry or have a relationship with?" LOV-C: "Would you allow your children to do a love marriage?" All variables are dichotomized such that the value one corresponds to secularized ideals.

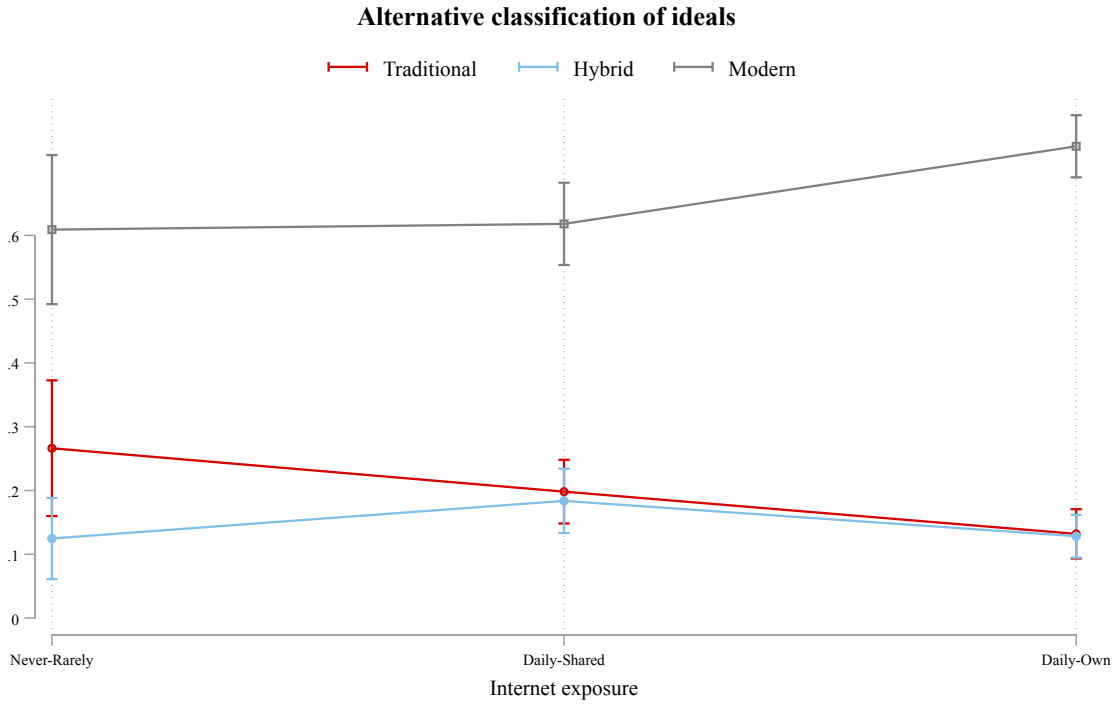

Figure A5: Predicted probabilities from multinomial logistic regression analyses predicting the alternative partnership ideal index broken into the three macro-categories

Notes: Weighted proportions. Analytical sample of 1,798 women. All controls included. Results are virtually unchanged with respect to those shown in Figure 3.

Appendix Tables

Table A1: Comparison of sample characteristics between DHS data (2019-21) and our survey data (2022)

	DHS (2019-21)	Our survey data (2022)
Age	22.3	24.3
Age of partner	N.A.	26.7
Years of education	12.6	11.3
Years of partner's education	N.A.	13.3
Years of mother's education	N.A.	8.1
Years of father's education	N.A.	10.8
Household size (adults)	5.2	4.1
	Work participation (%)	
Not working	73.6	40.3
Working- full time		23.4
Working- part time/occasionally	26.4	13.5
Studying		22.3
	Region (%)	
North	37.9	36.4
Northeast	14	10.5
Central	13.5	15.6
West	12.5	10.9
East	4.9	5.3
South	17.1	21.4
	Caste (%)	
General	27.6	31.4
OBC	38.4	31.6
SC	18.9	24.6
ST	14.8	12.5

Notes: DHS samples limited to unmarried women in urban areas to match women in our survey. DHS sampling weights used for DHS data. Unweighted estimates for our survey data.

Table A2: Attrition analyses

Non-missing	Obs.	Mean	(SD)	Min	Max
Partnership ideals index (score, 6 items)	1,798	2.752	(1.073)	0	6
Traditional (categorical, built from score)	1,798	0.118	(0.322)	0	1
Hybrid (categorical, built from score)	1,798	0.269	(0.443)	0	1
Modern (categorical, built from score)	1,798	0.613	(0.487)	0	1
Daily Internet use	1,798	0.910	(0.286)	0	1
Daily Internet use on own device	1,798	0.500	(0.500)	0	1
Missing on controls	Obs.	Mean	(SD)	Min	Max
Partnership ideals index (score, 6 items)	153	3.098**	(1.042)	1	5
Traditional (categorical, built from score)	153	0.078^{+}	(0.270)	0	1
Hybrid (categorical, built from score)	153	0.184**	(0.389)	0	1
Modern (categorical, built from score)	153	0.737**	(0.442)	0	1
Daily Internet use	153	0.922	(0.269)	0	1
Daily Internet use on own device	153	0.730**	(0.445)	0	1

Note: Weighted data. Stars reported in the bottom panel refer to t-tests for differences in means between non-missing and missing women. Obs.: Number of observations. SD: standard deviation. ** $p<0.01$, * $p<0.05$, $^{+}$ $p<0.1$.

Table A3: Full-specification estimates without (raw) and with (MI) multiple imputation using chained equations

Partnership ideals index	**Daily Internet vs not**		**Daily Internet on own device vs not**	
	Raw	MI	Raw	MI
Internet exposure	0.128	0.162	0.195*	0.191*
	(0.121)	(0.110)	(0.081)	(0.078)
All controls	Yes	Yes	Yes	Yes
Constant	3.924**	3.424**	4.203**	3.681**
	(0.382)	(0.381)	(0.374)	(0.378)
Observations	1,798	1,951	1,798	1,951

Note: Weighted data. Robust standard errors in parentheses. Stars reported in the bottom panel refer to t-tests for differences in means between non-missing and missing women. MI: multiple imputations. ** p<0.01, * p<0.05, + p<0.1.