The Gendered Impacts of Access to Smartphones: Evidence from India

Aarohi Hemmady

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Mobile learning is expected to reach a market value of $78.5 billion by 2027, indicating a positive trend towards using smartphones as educational tools. Although research has been done on the positive correlation between smartphone ownership and educational attainment, the gendered impacts of access to smartphones have been overlooked. I will be focusing on evidence from rural India. I theorize that access to smartphones will increase the educational motivation and career ambition of both males and females, but will have a more pronounced effect on females. I use qualitative evidence gained from in depth one-on-one interviews with male and female Indian college students to show that smartphone access is strongly correlated with career and educational ambition. I also outline the gendered differences in smartphone usage and how they tie in with the digital divide. I found that regardless of gender, interviewees' confidence in accomplishing their career and educational goals increased after obtaining their first smartphone. Smartphones have also served as mechanisms to apply to and land jobs, widen their social network, and take courses outside of college. However, smartphones proved to have a more pronounced effect on a female's career and education confidence. I found this was due to the Role Model Effect. Most males listed their professors, fathers, or mothers as their guiding inspirations, while most females listed successful women they have been exposed to by their smartphones.

Keywords: gender studies; education; career; smartphone

Introduction

Recent literature has proven communication technologies impact women's empowerment. Information technologies have been proven to create opportunities for women, allowing them into political, social, and economic processes they've always dreamed of experiencing[1]. While it has been theorized that technological globalization creates jobs and access to education for women, no studies have been conducted on the role of smartphones on women's education and career. We lack concrete evidence connecting these two variables. This paper will fill this gap in literature by probing the following question: How do smartphones increase one's career ambition and educational motivation and are these effects conditioned by gender? This paper explores how smartphones impact Indian male and female college students' career ambition and educational motivation by examining three mechanisms: confidence, social networks, and access to education.

I develop a theory of how smartphone access increases educational motivation and career ambition. Smartphones guarantee access to news events, role models, and job opportunities, which will close the gender gap imprinted by society. Smartphones also instill a broader idea of what is possible, increase confidence, and increase access to smartphones.

To test this theory, I conduct a qualitative, international analysis of the relationship between smartphone access and Indian male and female college students' educational and career ambitions. I use process tracing to test the proposed causal mechanisms.

This paper makes several contributions to the scholarship field of technology, education, and career. First, it clearly shows the differences between male and female educational motivation and career ambition after obtaining a smartphone. Females were more likely to want smartphone access and were more likely to have female role models online. My paper dissects the true effects of the digital divide by studying villages in India, regions where traditional ideology takes precedence.

In addition, I also found surprising results on the digital divide in India. Women mentioned being encouraged by society to chase their dreams. They also attributed a lot of their success to their smartphones and said their smartphones helped them reach the high expectations their parents have for them. India's infamous gender blocking divide seems to be bridging.

The paper proceeds as follows. The first section provides scholarship context for my paper and explains how my research fills a gap in the literature. The second section explains my theory and argument based on research done before starting my interviews. The third section explains how I recruited, collected, and analyzed data. The fourth section presents qualitative evidence for my theory. The final section discusses the results and

concludes.

Literature Review

A growing body of scholarship has examined the relationship between communication technologies and women's empowerment, but there are still many aspects left to unpack. Elia Alves and Andrea Steiner found ICTs create opportunities for women, allowing them into political, social, and economic processes they've always dreamed of experiencing [1]. They propose that technological globalization correlates with women's empowerment through new jobs, entrepreneurship opportunities, and/or thorough education. Economic opportunities through ICTs can change women's family and workplace roles and unlock limitless career opportunities. Additionally, access to ICTs provides women with access to powerful knowledge. Finally, Alves and Steiner note that ICTs promote remote learning, which can spread quality education to women who need it.

They mention that there have been no studies done on the role of new information technologies on women's education and employment, allowing my research to be the puzzle piece completing the puzzle. Alves and Steiner focused on women around the World, a broad generalization, making their findings difficult to apply to specific areas or solve with specific policies. I choose to zoom in on Indian rural communities with traditional ideologies as I've noticed a gap in literature in this area. Doing so, I will be able to further analyze the effects of the digital divide on my favored outcomes: career ambition and educational motivation. Villages are often areas where the digital divide is prominent, making my analysis of gendered impacts especially important. Additionally, rural areas are often located far from quality schools, libraries, and career opportunities. Examining the impacts of smartphone access will provide insight as to how smartphones are helping people overcome some of these challenges. Small villages in India also have unique traditions, values, and customs that may impact technology's effectiveness. Lessons learned from my research are applicable to men and women around the World, creating definitive answers to crucial questions.

On the other hand, research has found that there is a gendered gap in terms of access to ICTs, meaning that as ICTS become more commonplace and integrated into our lives, women are left behind their male counterparts. Unequal technological access is present in almost every country, each social class less fortunate and with less Internet access than the prior [2]. In 2013, angry mobs of Brazilians protested against the billion dollar budget for the World Cup, claiming the government cared more about a sport than allocating money to make national improvements. The protesters were mostly white and belonged to the upper classes, so one thing became clear: the rich and poor social networks did not overlap as the digital divide in Brazil was defined by geography and income. While the research addresses social and digital inequalities, it does not explore gender or educational disparities. Furthermore, it focuses on the elite's role in influencing these inequalities, leaving questions about marginalized groups unexamined. My study builds on this research by shifting the focus to rural and traditional communities, specifically examining how smartphones influence women's education and career opportunities in lower socioeconomic classes. By addressing gender and educational inequalities, my work investigates whether such communities can use technology to empower women or remain constrained by long standing sexist norms. This approach provides a more nuanced understanding of the digital divide's intersection with gender and education.

Going back to Alves and Steiner's work, the pair noted internet access may only be significant when paired with a reduction in the digital divide [1]. In comparison to men, women still lag behind in achieving digital literacy. In a broader sense, women face challenges in terms of limited opportunities for income, education, training, as well as gender roles and women's restricted participation in politics and decision-making. This limiting factor is something I must clearly consider in my paper.

Global G.L.O.W. has also touched on similar issues, specifically taking Indian women into account by incorporating important statistics and explanations to show the digital divide's effect [3]. For example, Indian females are 56% less likely to use mobile internet than males. This could be due to traditional norms, societal expectations, or limited access to smartphones. Furthermore, only 28% of Indian women own cell phones, compared to 43% of Indian men. The disparities in numbers are hard to ignore, making the digital divide even more important and pressing in my paper. Smartphone usage differs between males and females, but it is crucial to understand the different ways smartphones impact male and females, which my paper will cover.

I focus on rural communities in India which can be impacted by patriarchal attitudes. Patriarchal attitudes restrict women's rights to public spaces as well as private ones, which can strip them from technology and thus from educational and career opportunities. Companies should put in conscious efforts to employ women, schools should diminish gender biases, WiFi should be strengthened in villages, and India should provide resource centers to women looking for employment or schooling opportunities. I investigate smartphones' effects on the digital divide and on women's outlooks on their own lives based on how technology has served their needs.

Theory

I argue that an increase in access to smartphones allows access to a wider social network, guaranteeing greater exposure to news events and role models. This will unlock greater access to education, a broader idea of what is possible, and an increase in confidence, leading to an increase in career ambition

and educational motivation. Moreover, I argue that these impacts will be gendered. While access to smartphones will raise women and men's career ambition and educational motivation, the increase will be more pronounced for women. I posit this because the access to information, social networks, and potential role models smartphones provide is likely to be newer for women than it is for men. Recent literature has linked women's empowerment with communication technologies, so I assume smartphones can prove to have a similar relationship with ambition[1]. Smartphones have social media and educational and career applications which have the potential to increase ambition further than past communication technologies.

In the context I study, gender inequality and traditional values that can discourage women from pursuing higher education and careers outside the home are prevalent. Without smartphones, men might already have role models in their community and access to information and social networks that can advance their education and their career. Women are less likely to have this access without smartphones[4].

The Role of Smartphones

Social media allows people to tap into their networks for finding work, alert friends when they hear about position openings, or promote their skills in a way obvious to potential employers. 50% of young adults have used a smartphone during a job search[5]. Smartphones and social media also give access to news events and role models. 68% of Indians use their smartphone as their primary tool for news consumption[6]. The role model effect allows for both men and women to have a broader idea of what is possible, as well as an increase in confidence. By modeling the possibility of female activity and achievements in politics, women politicians encourage greater interest in political participation among girls[7]. Access to smartphones allows men and women to see people performing jobs that are different from what they see around them, also expanding their idea of what is possible. Having a smartphone grants access to communication, news stories, role models, possibilities, and confidence, which will all increase educational motivation and career ambition.

Gendered Impacts of Smartphones

I argue that the impacts of smartphones on educational motivation and career ambition will be different for men and women. While smartphones are an important tool for education and career regardless of gender, the value they add for women is greater because of women and men's relative position in society. While men likely have role models, social networks and information that can advance their career in their communities, women may not. In fact, men aren't losing role models, women are, due to historical and societal female inferiority[8]. Smartphones can provide women their own role models to look up to, as well as access to educational and career tools. This will enhance their career and educational ambitions, expand their realm of possibilities, and bridge the gendered digital divide.

The role model effect is greater for women because they are less likely to observe professional and educated females in their own lives. In politics, female politicians often credit themselves with the inspiration of young women in public service, claiming they are positive role models for women and girls to mirror. Male candidates, however, do not advertise their presence as positive role models, as young boys need no additional evidence that power and resources are available to them[7]. Actions of female role models go deeper than surface level; they boost educational motivations and time management skills, not just aspirations[9]. Young girls will see successful and working women online and expand their realm of capabilities.

Gender identity as a social construct is highly correlated with educational goals and career choices. Gender disparities are almost always cited as a factor behind the difference between male and female aspirations, especially in politics. It has been proven that women are less likely to become scientists because they don't see same-sex scientists. Exposure to female experts in career areas will boost women's morale and launch them into traditionally male dominated roles[9]. Gender ideology and roles inhibit women from maximizing their capital (education and experiences). Additionally, men don't see the need for women to have jobs outside of their homes. In order to close the gender gap, policy makers must advocate for changes that remove restraints on women to realize their full potential as professionals. On top of this, NGOs and MFIs have effectively encouraged women to work in male dominated sectors[10]. Smartphone ownership will allow women access to these NGOs as well as to role models.

Hypothesis

My theory leads to the following hypotheses:

H1: Access to smartphones will increase individuals' educational motivation and career ambition through increasing confidence, widening their social network, and allowing greater access to education.

H2: This effect will be more pronounced for women than for men because women are less likely to have smartphones, may be less encouraged to pursue education/career by community/family members, and may not have role models in their communities for the careers they want.

Methods

I use process tracing to examine the causal relationship between access to smartphones and educational and career ambition.

Process tracing is a qualitative analysis tool used to examine evidence and trace it back to the argument. Once evidence is gathered, process tracing systematizes the findings in light of research questions and hypotheses posed by the investigator[11]. In other words, the ultimate aim of process tracing is to identify the steps that lead to a particular outcome while confirming or denying several hypotheses. In my project, I theorize that increased access to smartphones will unlock access to a wider social network, an increase in confidence, greater access to education, and exposure to alternative social norms which will ultimately lead to increased educational and career ambition. In my interviews, I ask questions that allow me to see whether respondents follow or defer from this path. I will review my qualitative evidence with the process tracing test chart found at the end of this section. If the evidence for a hypothesis or argument is sufficient, I will rely on qualitative interview data and my theoretical framework to explore the underlying reasons. Similarly, if the evidence for a hypothesis is insufficient, lacking, or contradictory, I will use the same approach to understand the discrepancies.

I selected rural India as my primary research location partly due to the nation's growing digital divide and partly due to my connections- including work with an educational non-profit- and cultural understanding. Only 28% of women in India own a cell phone. Unless the digital gender divide is studied and acknowledged, the political, social, and educational marginalization of females will only increase[3]. Societal expectations, traditions, and cultural norms are the main factors behind this digital divergence, three things that can easily be observed and noted in rural Indian villages. The effect of the digital divide in a traditional environment is perfectly displayed by the young college students I interviewed.

I conducted 5 interviews over Zoom with both male and female Indian college students. To recruit participants, I reached out to students at an Indian engineering college, whose numbers I gained access to from both a non-profit I have worked for and my family friends who have been associated with the college. These students live in rural villages scattered across Maharashtra. In preparation for these interviews, I created a research plan, questionnaire, and IRB approval form which was signed by an administrator at my school. With both online and verbal consent from and anonymization of each participant, I asked questions on their background and demographics, college workload, confidence in school, career outlook, career confidence, ways in which they use their smartphones, and cultural, societal, and familial expectations. If at any point in the interview, a respondent was uncomfortable answering a question, I made it clear that they could skip the question or stop the interview. We took breaks in between questions so the translator could explain and so I could take notes. At the end of the 5 interviews, I had all 5 interviews transcribed and ready to analyze.

I assess the evidence for my hypotheses by applying process tracing to these interview transcripts. More specifically, I analyze these interviews for the empirical implications of my hypotheses, outlined in Table 1 below. This table will be referred to when discussing my results. For example, smartphones should not only be mentioned when discussing useful tools for school, but respondents must mention increased participation and confidence in college and career.

Results: Qualitative Evidence from India

This section assesses evidence for the causal mechanism proposed by Hypothesis 1. I trace the evidence for the *increase in confidence, widened social network, and increase in access to education* mechanisms from qualitative interviews with both male and female Indian college students. I then turn to alternative explanations if necessary.

Interviewees consistently noted that they felt a high level of confidence in accomplishing their career and educational goals after obtaining their first smartphone, regardless of gender. Every respondent connected their confidence to gaining more knowledge, resources, and skills. One interviewee said, "I built my high confidence level by reading information online." Another interviewee said, "I listen to motivational speeches on YouTube. By seeing other people work hard to achieve their goals, I built my own career confidence." There is clear evidence that access to smartphones increases educational and career ambition by increasing confidence. However, females proved to be more dependent on their smartphones for career and education confidence, which will be discussed more under "General Gender Differences".

Owning a smartphone will widen one's social network, granting them more opportunities, boosting their educational and career ambition. 100% of respondents used their smartphones to contact professors and text friends for help with homework assignments. Additionally, they mentioned looking elsewhere for help on their smartphones. When asked how his attitude towards school had shifted since obtaining access to a smartphone, one interviewee said, "My attitude has improved greatly. If professors aren't proficient in teaching concepts, I feel like it is better to go online and learn that concept." His social network was clearly broadened as he not only feels comfortable contacting professors and friends, but can find information from anyone around the World on his smartphone.

Smartphone ownership has transformed career ambition by presenting job opportunities as well as ways to contact potential employers. Every respondent learned about or learned more about the career they're pursuing from their smartphones. Prior to owning a smartphone, respondents were less clear on the career they would pursue. One answerer said, "I did not know what I wanted to do. I didn't know there were this many opportunities in electrical engineering until I got a smartphone." Another noted, "I always knew I wanted to work in technology,

Table 1 Hypotheses and Empirical Implications I

Argument	Empirical Implications
H1: Access to smartphones will increase educational motivation and career ambition through:	Respondents mention smartphones when discussing which tools have been useful in school
Increasing confidence	Respondents mention participating often in class, feeling confident as a student, and feeling confident in accomplishing their career goals. (After smartphone usage)
Granting a wider social network	Respondents mention meeting new people, getting access to more jobs, being able to contact professors and get help/motivation due to smartphone access.
Allowing access to more education	Respondents mention that educational applications have been beneficial and mention using their smartphones as tools for completing schoolwork and additional courses.
H2: This effect will be more pronounced for women than for men because:	
Women are less likely to have access to smartphones	Women will mention that they brought up buying a smartphone to their parents and not the other way around. They also might add that they have restrictions on their smartphone usage or were not allowed access to family smartphones prior to getting their own.
Women may be less encouraged to pursue education/career by community/family members	Women discuss differences in parental expectations of them versus personal expectations of themselves in terms of career and education. On the other hand, men might have planned their educational and career goals with their parents and they might have pushed them to take more on (adding to their ambition/motivation).
Women may not have role models in their communities for the careers they want	Women discuss a lack of role models in their immediate family or friendships. They also add being inspired by successful women online in their respective fields of interest. Men discuss having role models in their community that inspired their educational motivation and career ambition.

but my smartphone helped me gather the skills to make this dream a reality." Regardless of gender, smartphones increased opportunities and allowed these students to broaden their horizons. Smartphones have helped respondents narrow down their career and educational goals. When asked about his career goals before having a smartphone, an answerer said, "I did not have a goal, I was just going with the flow." However, after obtaining a smartphone, every respondent plans on applying to and searching for jobs using their smartphone. All of them have already set up informational interviews or contacted potential employers on their phones. There is clear evidence that access to smartphones increases educational and career ambition by widening and creating social networks.

Finally, and perhaps most importantly, access to smartphones unlocks educational opportunities which increases educational motivation and career ambition. When asked which tools help them complete their schoolwork, every respondent mentioned their smartphone as a key instrument. Interviewees reported an average 4.3 hours of smartphone usage per day, adding that they use their smartphones to read information about their areas of interest, complete work, learn coding languages, and watch lectures on YouTube. To complete schoolwork, many also downloaded educational and career applications such as Duolingo, Linkedin, GitHub, Google Classroom, Word, Sheet, Powerpoint, Zoom, and more. In one specific case, when asked about educational and career apps, a male respondent said, "I've been preparing for the GATE exam, so I downloaded apps to help me study as well as apps that you can give the exam on. I've also used apps to apply to government scholarships." For context, the GATE exam is an exam that must be passed to earn a master's degree in India. Similarly, a female respondent said she watches videos on YouTube to prepare for the GATE exam. In both cases, students were granted more opportunities to further their education because of their smartphones.

Along the lines of widening social networks and granting more education opportunities, smartphones have been proven

to increase news following. Majority of respondents reported reading the news more frequently after obtaining a smartphone. Specifically, they went from only reading the sports column to reading from news applications and watching news videos on YouTube everyday. In addition, every respondent reported using their smartphone to take additional classes (outside of college) and to receive tutoring. Many of them have taken advantage of global non-profit organizations for tutoring. A female interviewee said, "I use Youtube to learn things outside of college that will be helpful for my career." There is clear evidence that access to smartphones increases educational and career ambition by increasing educational opportunities.

General Gender Differences

The evidence I found that positively correlated smartphone access with career and educational ambition also supports that smartphones have more pronounced effects on women than on men. I will now discuss general differences in how male and female respondents answered questions. This parallels my second hypothesis: Females will experience a more pronounced effect on their educational motivation and career ambition after obtaining a smartphone than men will. I trace the evidence from my interviews with both males and females, and will turn to alternative explanations when necessary. I will start with gendered differences I found while tracing one of my key mechanisms: smartphones increase confidence which increases educational and career motivation. I will then explain and support my proposed mechanisms for Hypothesis 2.

While tracing the "increase in confidence" mechanism, I found clear gender differences that highlight the unique impacts smartphones have on both males and females. When asked about the tools that helped them build their confidence, women and men differed in their responses. Females attributed their confidence to reading information online from e-books, on Google, or YouTube, as well as from online courses or classes they've taken on their smartphones. One female interviewee clearly stated, "As I improved my skills, my confidence improved. My smartphone helped me in the process." Women turn to digital resources for educational and career confidence because they may lack female role models for the types of careers they want, building on the role model effect mechanism. Women have faced societal oppression, prompting them to seek confidence from alternative sources, such as information and smartphones. On the other hand, males originated their career and educational confidence in societal aid. A male interviewee said, "I felt educational confidence because I got a lot of help from others which kept me in the loop. This allowed me to confidently present information and succeed in college." When asked about career confidence, males also attributed their feelings to past working experiences and jobs, many of which were given to them by recommendations from professors.

Interviewees' responses also varied greatly when asked how often they participated in class in their college days. The majority of female respondents said they don't feel confident participating in class, while all male respondents noted high confidence in public speaking and educational participation. The female respondents said they often don't participate in class due to their lack of self-confidence. They said they feel more comfortable participating when they have their girl friends with them, supporting them, and they also participate when they're knowledgeable about the subject being discussed. They said they will find more knowledge using their smartphones on apps such as Google and YouTube. Males said they felt extremely confident participating in class as their friends, families, and professors built them up to feel comfortable in their educational setting. Females have been oppressed by society and in career and educational settings, tend to be less confident than their male counterparts[12]. However, female respondents clearly stated they will turn to smartphones to fill the void and build the confidence they lack.

Women are less likely to have access to smartphones, so smartphone access will help bring them out of their bubble and increase their career ambitions[13]. Every female respondent brought up buying a smartphone to their parents, but for males, the decision was made mutually (both the parents and child agreed together). When asked what restrictions they have on their smartphone usage, both males and females generally had little to no restrictions. I had previously thought that women would have more restrictions than males, but perhaps the people I interviewed came from liberal backgrounds with open parents. However, some females said that they were aware of data usage and felt they had to limit their smartphone activity. In addition, I theorized women wouldn't be the first in their families to get smartphones and would be banned from using the household smartphone. However, I received mixed results. Every interviewed male was the first in their family to get a smartphone, one of them was even gifted one by his younger brother. He said, "My younger brother saved up for me and bought me a phone since I didn't have money. I paid back the favor when I started earning from my job." Every female I interviewed was second or third in their family to get a smartphone, but was allowed access to the household smartphones before they had their own. This result can also be attributed to my previously mentioned alternative explanation that the people I interviewed had relatively liberal families and ideology compared to what I had initially predicted.

Women may be less encouraged to pursue their education and career goals by community and/or family members, so smartphones will have more of an effect on them. When asked if they faced any resistance from their parents or community in the pursuit of their education or career, every male and female respondent said no. What I found interesting, however, was that females gave answers such as, "No, my community encouraged

me to continue my education", while males simply said they did not face resistance. Whether females are more uplifted by society than males is unclear, but females made sure to add that they've been encouraged to chase their academic dreams. These kinds of results are not at all what I was expecting, which means the digital divide is slowly bridging in India.

I also believed the parents of males would have more specific or difficult goals for them, increasing their educational motivation and career ambition. But, female respondents noted their parents had high expectations for them, such as passing difficult government exams, getting government jobs, and being placed in highly reputable companies. Male respondents said their parents wanted them to be "happy and stable." Females have higher ambitions and motivation due to their parents' expectations, so my theory does not hold true. Smartphones will not necessarily have a stronger influence on a female's ambitions than a male's. But, there is still one factor left to examine.

Women may not have role models in their communities for the careers they want. Smartphones will help them see female role models and increase their ambitions. The majority of female respondents said they do not have role models in their community for the career they want to pursue. One female noted, "Both my parents are farmers. My father is also a driver and my mother is a housewife. Other people in my community are also farmers." As expected, females turn to their smartphones to seek role models. The same respondent said, "I see successful women on Instagram and YouTube reels." Males also agreed that they have role models online but were less likely to elaborate on this subject. Most males simply agreed that they found role models online that pursue different careers than the careers their parents/community pursue.

Summary of Results

The evidence from my qualitative interviews clearly supports Hypothesis 1 and the three proposed theoretical mechanisms. All respondents mentioned participating often in class, feeling confident as a student, and feeling confident in accomplishing their career goals after smartphone usage. They also said they met new people and were allowed more job opportunities thanks to the widened social network their smartphones offered them. Finally, interviewees took courses outside of college and explored educational applications on their smartphones which helped them complete their coursework and pursue their careers.

The evidence also supports Hypothesis 2: men and women use smartphones differently and there seems to be a greater impact for women than men. However, I did not find strong evidence for all of my proposed mechanisms. The Role Model Effect mechanism has the strongest evidence. As I predicted, males derived their educational motivation and career ambition from role models in their community. Majority of males listed their mother, father, and professors as their role models. They have immediate access to successful role models, while females turn to their smartphones for this. Hence, the effect of smartphones on career ambition and educational motivation is more pronounced for females than for males.

Conclusion

In conclusion, my research shows the role of smartphone access in shaping educational motivation and career ambition, particularly among female college students in India. By providing access to a wealth of information, including news events, role models, and job opportunities, smartphones serve as powerful tools in closing the gender gap perpetuated by societal norms. The broader spectrum of possibilities smartphone usage offers increases confidence and access to educational resources, empowering individuals to aspire towards higher academic and professional goals.

The findings of this study offer valuable insights into the gender divide, particularly in regions such as India where traditional ideologies often prevail. By examining the experiences of male and female college students in villages, this research reveals the impact of smartphone access on educational and career aspirations, with females exhibiting a greater inclination towards digital resources and female role models. This understanding challenges current narratives surrounding women's empowerment. It also shows the importance of addressing digital inequalities to promote inclusive socio-economic development.

However, there are certain limitations to this paper. Focusing on specific villages may not fully capture the varied ideological, cultural, and economical contexts across India. Additionally, the sample size, while sufficient for qualitative analysis, limits the generalizability of the findings. The unexpected findings regarding societal encouragement and parental expectations shed light on the complex relationship between cultural norms and how they shape women's career journeys. But, they also serve as a limitation. The liberal views of respondents' families could potentially skew the results towards progressiveness and possibly misrepresent the diverse ideologies of families in India. Furthermore, common technological barriers in the studied regions such as inconsistent internet connectivity as well as varied smartphone penetration in different regions, significantly influences smartphone access, presenting many challenges that may not be reflected in every area.

There are three confounding variables potentially influencing the observed outcomes: socioeconomic status, parental education, and prior academic achievement. The respondents' socioeconomic status ranged from lower middle class to middle class. This may have increased access to smartphones as well as educational ambition because the lower middle class and middle class see education as a method of upward mobility, placing great value on it. Additionally, this variable may have increased smartphone reliance for career ambition as those of

the lower middle class do not have access to the supplementary resources that someone of the upper class may have. The parents of respondents are mostly housewives and farmers, with the maximum education level being a high school diploma. This may have influenced outcomes as parents want more for their children than they had, pushing their children to get educated and build their careers, increasing respondents' motivations and ambitions. Lastly, all respondents had already completed high school and were attending college during the time of interviews. This clear emphasis on and value of education could have impacted ambition and motivation, possibly diluting smartphones' impact.

The bridging of India's gender divide, shown by female students attributing their success to smartphone access, highlights the transformative potential of information and communication technologies in promoting gender equity and fostering socioeconomic empowerment. Moving forward, policymakers must recognize the pivotal role of smartphone access in shaping educational and career trajectories, and work towards addressing digital disparities to ensure inclusive opportunities for all.

To build on the findings of this study, future research could explore the development of specific digital education tools designed specifically to boost women's career ambitions. Long-term studies can also be conducted on the career outcomes of women and men with smartphone access, both in rural as well as urban contexts. In my paper, women's families were more supportive of their educational and career ambition and ownership of smartphones than anticipated. Future studies could explore this variable by investigating how familial and societal perceptions influence women's smartphone use and careers, with a focus on how these perceptions evolve to challenge and overcome traditional ideologies.

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