

Data Privacy and User Awareness of Teenagers, in India, on Instagram in relation to Ethical Impact on Women.

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The research was designed to explore the level of awareness amongst teenage girls in India, regarding the ethical implications of data privacy in this evolving landscape of public laws and rapid advances in technology. Motivated by the overturning of Roe v Wade, this paper discusses data privacy and its possible ethical impact on women, with a study on user awareness focused on teenage girls in India. The paper discusses the case studies of Cambridge Analytica and Nebraska Facebook Abortion and conveys the relevance of the topic in the Indian context. The primary research was conducted online using a digital survey sent out to teenagers in India. Confirming the hypothesis, the data gathered revealed that up to 80% of the teenage respondents did not fully understand the implications of breach of data privacy nor have clarity on the privacy policies while signing up for social media platforms including but not limited to Instagram, TikTok etc. The study further found that over 90% of users had not completely read through the Instagram terms and conditions before they approved all access settings, and over 20% of users did not know how to turn off certain settings, such as location and photo access settings. Furthermore, the paper ends with recommendations on the process of increasing literacy around data privacy specifically amongst teenage girls and explains the need for further study and explorations in this field.

INDEX TERMS

Data privacy, Social-media Data Privacy in India, Data usage Policies, Ethical usage of Data, Instagram Data Usage Awareness, User Awareness, Teenage girls in India, User Awareness on Data privacy.

Introduction

Big Data is why we can collect and analyze data far more efficiently than we could years ago, hence data being used more often and strategically by corporations¹. Everything done on a device connected to the internet leaves behind a digital footprint². For any corporation to be successful, they require user data, so much so that data is currency³. Data is used to help develop better products, expand consumer bases, find cheaper factors of production, increase profit margins, get ahead of competitors, and get an overall more comprehensive understanding of their enterprise⁴. Hence, companies are willing to go to any lengths to access consumer data, and most users aren't aware of this. Data can be ethically used when companies try to increase value to consumers and have consent, as users provide the information and reap the rewards of using digital services⁵. Ethical issues arise when there is a lack of transparency and intention, raising questions about privacy and who has access to our data. In 2018, such a situation came to light through an ex-Cambridge Analytica employee⁶. Data Scientist Aleksandr Kogan gathered and sold data of over 87 million Facebook users without consent to Cambridge Ana-

lytica for political advertising⁷. This blatant breach of privacy shows how external companies can exploit user data and use it for malicious purposes without hacking. One of the most vulnerable groups to data exploitation is teenage girls. Despite extensive studies on the effects of platforms like Instagram on users' mental health, little attention has been given to the unethical use of data by corporations on underage girls, a significant demographic on such platforms⁸. Recent events, such as the overturning of Roe v. Wade, further emphasize the life-changing impacts of data privacy breaches on women. For instance, a 17-year-old girl's private Facebook conversation was used as evidence in a court case regarding an illegal abortion, highlighting the far-reaching consequences of data privacy violations and its specific impacts on girls⁹. The Roe v. Wade ruling in the United States constituted a significant juncture in the realm of abortion rights within the legal framework. Serving as the catalyst for this research, the study's focal point redirects towards comprehending the distinct obstacles encountered by adolescents in India within an alternate socio-cultural milieu. This shift stems from the absence of American user access, enabling an exploration of the potential consequences of abortion prohibitions on young Indian females. Data pri-

vacancy is not highly regulated in India, placing Indian teenagers at a heightened risk of having their sensitive information mishandled or exploited. If there are high levels of unawareness among Indian teenagers about data usage, they might inadvertently expose personal information, leaving them vulnerable to breaches that compromise their privacy. With regards to abortion, India having deeply ingrained societal norms and cultural influences could impact teenage girls' decisions regarding abortion and data sharing [Pallikadavath, Saseendran, and R. William Stones. "Maternal and social factors associated with abortion in India: a population-based study." *International family planning perspectives* (2006): 120-125.]. The social realities faced by teenagers in India include limited accessibility to healthcare services, such as abortion. Teenage girls facing unintended pregnancies can face complex challenges, potentially driving them towards unsafe alternatives if abortion laws become more restrictive. The inadvertent exposure of Indian teenage girls' abortion-related data could expose them to significant risks, including stigmatization, ostracization, and potential harm from conservative societal attitudes deeply ingrained in Indian culture that consider abortions taboo. These attitudes could lead to severe repercussions, including social isolation, familial discord, and even religiously motivated discrimination, jeopardizing their physical and emotional well-being. This paper aims to address the critical gap in research by quantifying the awareness of adolescent girls about the risks associated with their data privacy. It delves into the dynamics of how data privacy violations impact the lives of teenage girls, examining whether such invasions are becoming normalized. By mindlessly complying with the Terms and Conditions section, are we thereby saying it's okay for corporates to continue to turn their faces away from the enormous repercussions of such data intrusion? How aware are teenage girls of these violations and the impact they could have on them? The focus extends beyond the United States, specifically targeting teenagers in India. By shifting the spotlight to Indian teenagers, this study seeks to shed light on the potential consequences of data privacy violations in a different context, especially concerning abortion prohibitions and their ethical ramifications and provide an international outlook on the issue. In the subsequent sections, this paper will explore the intricate relationship between data privacy, ethics, and the awareness of teenage girls, particularly in the context of platforms like Instagram. By addressing these concerns, we aspire to empower young women and encourage platforms to prioritize user awareness and ethical data practices.

User awareness and data privacy

Phillip Nyonis' 2018 study discusses privacy and user awareness on Facebook in Africa¹⁰. Privacy and user awareness on Facebook. *South African Journal of Science*, 1-7.)). They

describe privacy as a 'claim of individuals, groups, or institutions to determine for themselves when, how, and to what extent information about them is communicated to others. Nyonis' study emphasizes giving users control of how much data they wish to share. It investigates the privacy awareness of Facebook users by observing their activity. Using a mixed methodology, their study observed users, tested the platform by attempting to clone a fake profile, and conducted a survey. Their finding showed that users are highly unaware of privacy settings on Facebook and often unknowingly share sensitive data. The positives of this study were that they specified that both parties need to be cautious, users using privacy settings to secure their data, and Facebook with providing a secure platform, and an accessible privacy policy. However, this study was limited to Facebook users in Africa, and the majority of respondents were undergraduate students. The survey was limited to 25 respondents, which may have prevented the findings from being extrapolated. Additionally, they did not consider gender-based influences.

Ethics and Data Privacy

According to Richards and King¹¹. *Big Data Ethics*. *Wake Forest Law Review*, 393-432.)) some of the crucial concepts that are overlooked with regard to data privacy are shared private information and whether it remains confidential or not. In this era of Big Data, it would involve coming to a consensus around the idea of shared information. The question we need to ask is whether by sharing information to one website or social media platform are we giving away our right to private information. Does sharing information on social media or making it public make it public property? Another idea that Richards and King discuss in their paper is that of transparency and how the use of Big Data can be made much more relevant given that institutions such as law enforcement, credit scores, recruitment agencies, etc. are all using AI and Big Data to make decisions that impact the everyday lives of millions of people. In this scenario if laws and ethics are clear around transparency of the use of data, by second or third-party vendors it would also help the public gain more confidence in Big Data, thereby sharing more information, and hence lead to better or relevant results out of Big Data processing. Our paper discusses a more specific scope, focusing on awareness in teenage girls in India, rather than the general public. In his paper, Wright suggested that in order to ensure that the benefits or advantages of technology outweigh the disadvantages, issues around data privacy and ethics should be addressed collaboratively involving stakeholders, including masses or civil society to together create frameworks required to develop workable structures in the field of Responsible, Research and Innovation¹². "Ethics and Privacy in AI and Big Data: Implementing Responsible Research and Innovation".

IEEE Security Privacy, 26 - 33.)). The stakeholders in our study were teenage girls based in India. A major problem with regard to data privacy is that it is not absolute. It is highly dependent on the context and the relationship between the giver and receiver of data. The use to which the data is being put is also something that needs to be considered before we classify it as ethical or unethical use of data. For example, the information that a person has a highly contagious and fatal disease is a clear example of how the context changed our perception of the ethics of data privacy here. Due to this, for our study, we created a spectrum of how public or private a profile can be, based on what settings users had given permissions too. Personal privacy and the greater good of the masses in this scenario were pitted against each other, and here privacy became secondary. Similarly, when a doctor knows more about a patient, he/she can treat with greater accuracy and precision. In this scenario the patients personal welfare might precedence over his/her privacy. According to David J. Hand, many such ethical dilemmas need to be addressed before we can devise a framework for what counts as ethical in this regard¹³. Pseudopublic political speech: Democratic implications of the Cambridge Analytica scandal. Information polity, pp. 429-434.)).

Methodology

Research question Due to the comparative lack of material on data privacy research, this study will focus on user awareness and its impact on algorithms¹⁴. Information privacy research: An Interdisciplinary review. MIS Quarterly, pp. 989-1016.)). It will also discuss ethical uses that may arise in the future, as have in the past with Cambridge Analytica and the Abortion court case. The discussion will be focused on women due to the recent overturning of Roe v Wade. The final research question: 'How aware are teenage girls about data usage policies on Instagram and what is the correlation between privacy settings given on Instagram and self-perceived user experience?' The objectives of this study are to assess the level of awareness among teenage girls in India about Instagram's data usage policies, understand the correlation between data access permissions given to Instagram and the resonation of advertisements, and provide insights and recommendations that can enhance the awareness of data usage policies and improve the user experience of teenage girls on Instagram.

Method

To approach our research question, we observed the post-positivist research philosophy[Post-positivist research philosophy - a metatheoretical stance that critiques and amends positivism and has impacted theories and practices across philosophy, social sciences, and various models of sci-

entific inquiry.]. We created an online survey targeted at teenagers who use Instagram on daily basis. Instagram was selected as it is the platform that teenage girls use the most and is owned by Facebook's parent company⁸. Social Media Platforms and Demographics. The London School of Economics and Political Science)). Facebook has a known history of unethical usage of data⁶. Teens, Social Media Technology. Pew Research Center, 2-4.)). Most studies done so far on Instagram are in relation to mental health, while there are not as many on the awareness of Instagram's data privacy policies. Our primary focus was the resulting ethical impact on women - 68% of Instagram users are female⁸. Social Media Platforms and Demographics. The London School of Economics and Political Science.)). To collect data, we used a quantitative approach featuring self-report measures on carefully selected samples. We created an online survey with over 180 participants. Only responses that fit the criteria of age group and location were considered. We focused the questions on user awareness and Instagram's data-based algorithms. Then, we explored correlations in metrics of our dataset to see how time spent on Instagram gives the algorithm more data on users and how this impacts advertisements and spending on Instagram. In addition, we observed how aware users were of how to control their privacy settings and user terms and conditions. Furthermore, to briefly understand the sample's awareness around the unethical use of data, an example of a popular data privacy breach, the Cambridge Analytica Scandal, was taken to measure their understanding.

Design

This study is based on self-reported answers from a sample to our online survey. Questions contained specific instructions to enable respondents to provide accurate answers. The response options included multiple choice, scaled, and short answer responses. The sample was aware that their responses would be used in a research study. Working with sensitive data from teenagers, all data was collected anonymously and with consent. All questions are included in the Appendix.

Sample

Our sample was 180 users of Instagram, with over 82% being female or non-binary . The sample was based in India and fell primarily in the age group of 15-18.

Hypothesis

1. Underage female users are unaware of how Instagram uses their data.
2. A more exposed Instagram profile leads to more targeted

ads, more spending, and more clicks on sponsored posts.

User awareness measures

The measures we took to study user awareness asked if the user read the terms and conditions before signing up for Instagram, how aware the user is about the Instagram privacy policy, if users are aware of how to control the data they share with Instagram, if users are aware of how to turn off location settings, such as location and contact sharing settings, and if users are aware of past issues with Facebook privacy policy, such as the Cambridge Analytica Scandal.

Correlations

We plotted correlations based on our results to study how data was being used and accessed by Instagram. They included:

- 1)The number of permissions given access to on Instagram and how much the user thinks the advertisements resonate with them.
- 2)The number of permissions given access to on Instagram and how many times they bought something from an Instagram advertisement, sponsored post, or Instagram store in the past year.
- 3)The number of hours a user spends on Instagram and how well the user think the advertisements they see resonate with them.
- 4)The number of permissions given access to on Instagram and the number of hours a user spends on Instagram.
- 5)How often user signs into external third-party websites their Instagram login and how many times they bought something from an Instagram advertisement, sponsored post, or Instagram store in the past year.

Impact metrics

-How much time do users spend on Instagram (i.e., how addictive is it) -How aware are users of Instagrams terms and conditions -How accurate is Instagram's profile of users (i.e., how much do the advertisements resonate with users) -How much money do users spend on Instagram (i.e., how many times users bought something on Instagram the past year)

Results

This section depicts our survey results in figures.

Discussion

The aim of this study was to find out how aware teenagers in India are about how their data is being used by Instagram and discuss the ethical impact of data privacy on women. Analysis of the survey results showed many interesting findings. Our results show that over 90% of users had not completely read through the Instagram terms and conditions before they signed up for the app, and over 80% of respondents were not familiar with the Instagram data policies, this can be seen in Figure 2 and 3. These findings are consistent with our first hypothesis. In addition, a concerning result we noticed, was that 20% of users did not know how to turn off certain settings, such as location settings and contact settings, as shown in Figure 4. This restricts user control, and shows a lack of awareness, on sharing of their data.. If they are unaware of how to stop sharing these settings when they want to, it limits their control. Not knowing how to stop sharing location, plays a key role in physical safety. As of 2022, Instagram has introduced a new feature called 'precise location' which, as the name suggests, tracks users' accurate location and updates it regularly. This can be easily accessed by external sources, which can place users in physical danger and risk¹⁵. Is Instagram sharing your "precise location" with others? Here's what it has to say. Times of India, p. 1.)). Since this is more of an underground new feature, it is imperative that users know how to change location settings, and seeing that 20% of users do not know how to turn this off can be highly unsafe. Another possible risk stems from the discussion of Roe V Wade above. The overturning has a direct impact on women, and higher on teenagers, and building awareness around how to keep your private information safe to prevent legal bodies to be able to access it without consent is imperative. The idea of consent also needs to be considered when the users being discussed are underage, unaware of how to turn off settings, as shown in Figure 4, and most importantly do not know how their data is being used and what they are consenting to, as shown in Figure 2 and 3. Possible solutions and measures that should be taken to tackle this include creating a summarized and easy-to-understand version of Instagram's privacy policy, to encourage more users to read it and understand how to control the data they share and stay safe on the platform. This would be effective as users are more likely to read a shorter version of the policy that they can understand, in contrast to a large, incomprehensible document. An easy-to-understand video could also work towards creating more awareness. As the Instagram age limit is 13 and above, watching this short video could be enforced before creating an account on Instagram, especially for users under the age of 18. Teenagers may be more likely to understand data privacy and how to be safe with data through a video, which could prevent future unethical incidents from happening, as users learn about encrypted

This section depicts our survey results in figures.

Survey results gender composition

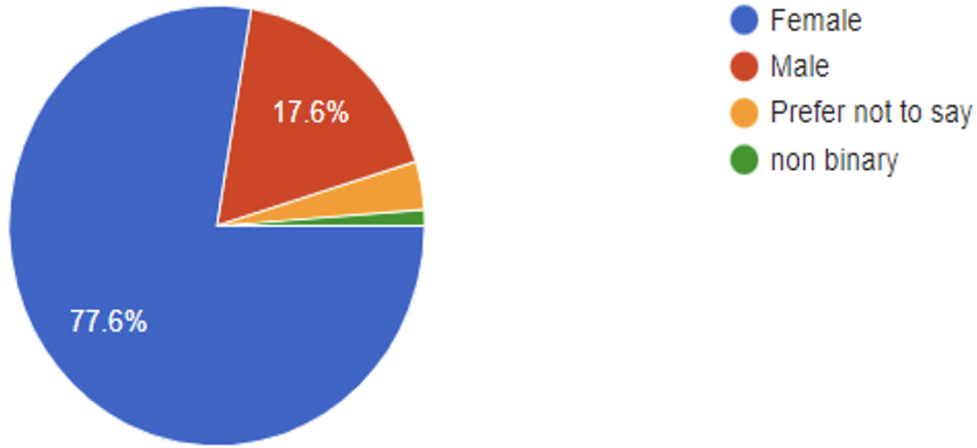


Figure 1: Gender composition of survey respondents

Survey response on if users read through the terms and conditions before they signed up for Instagram

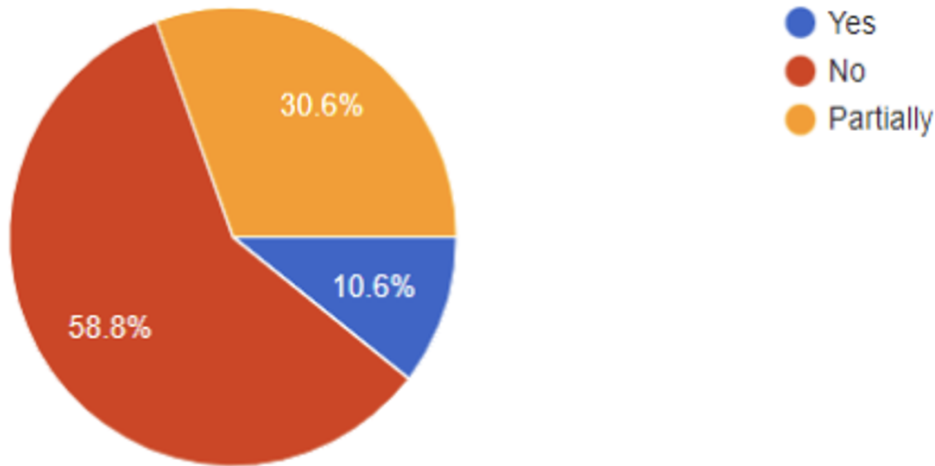


Figure 2: Users read through T&C before signing up

Survey response on if users are aware of the contents of Instagram’s terms and conditions around usage of user data

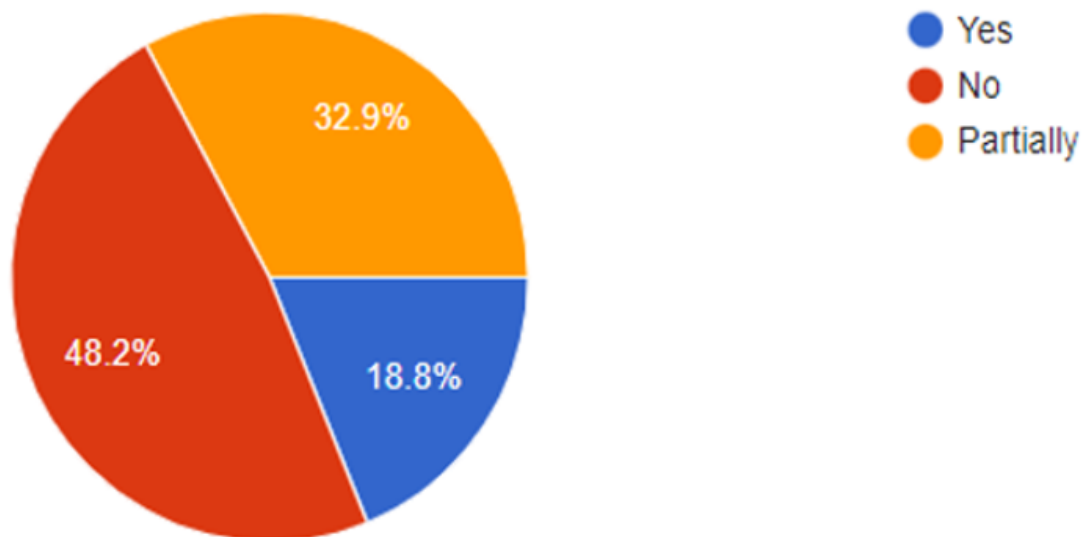


Figure 3 : Awareness of contents of Instagram T&C around data usage

Survey results on user awareness on how to manage Instagram settings such as Locations

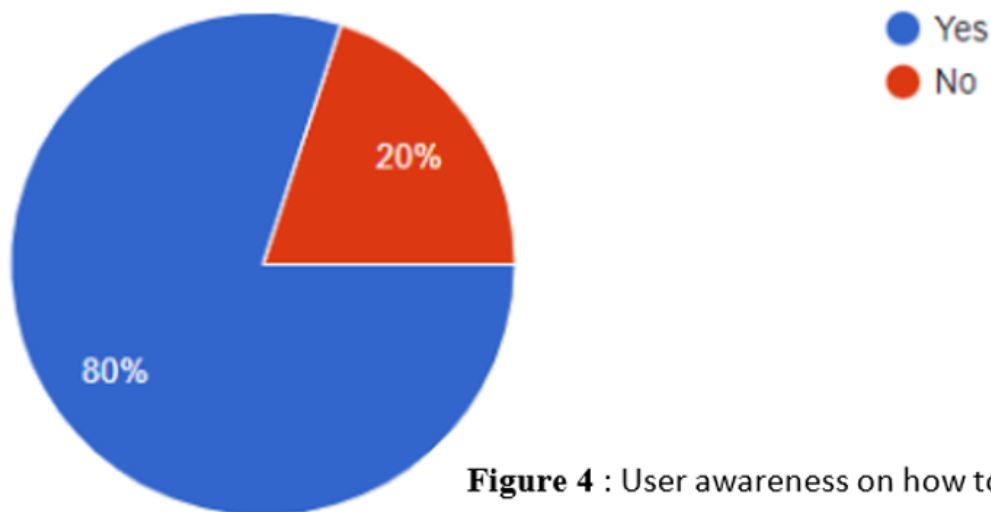


Figure 4 : User awareness on how to manage privacy settings.

messages and more. These videos could also be shown in schools periodically, for grades with students over the age of 13. Our survey also looked at how user data was used by In-

stagram. The survey results, Figure 5, showed that the more permissions approved by users on Instagram, the more the advertisements users saw resonated with their tastes and pref-

Survey responses on how many permissions user has given access to on Instagram and How well the advertisements resonate with user.

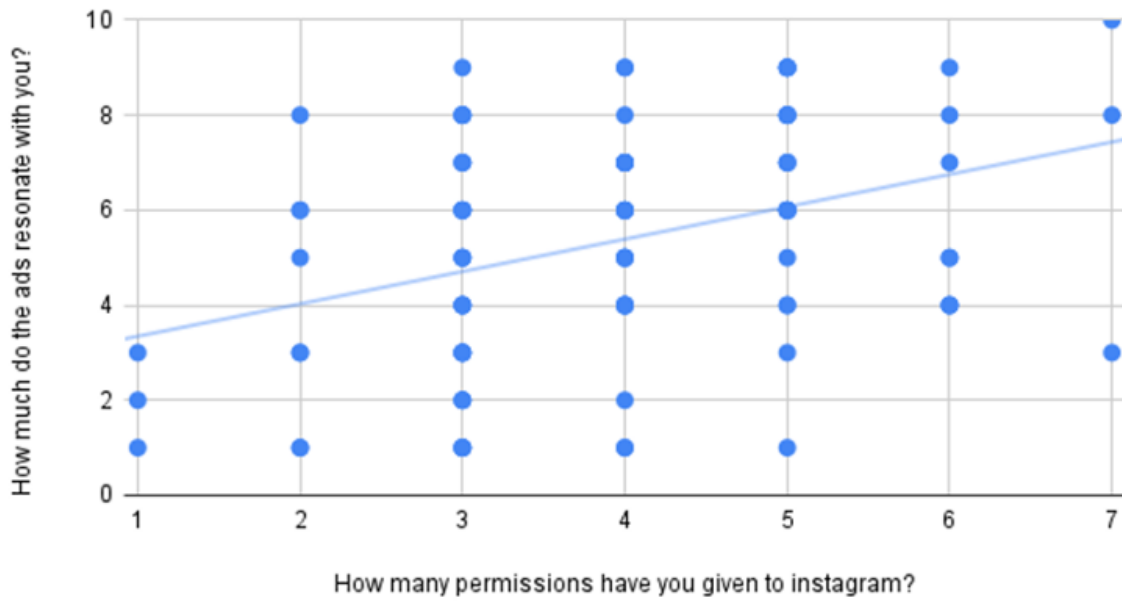


Figure 5 : Scatter graph depicting correlation between permissions given access to on Instagram and how well the advertisements the user sees on the platform resonate with user.

Survey responses showing the correlation between permissions given access to on Instagram and how many times the user has bought something on Instagram in the past year.

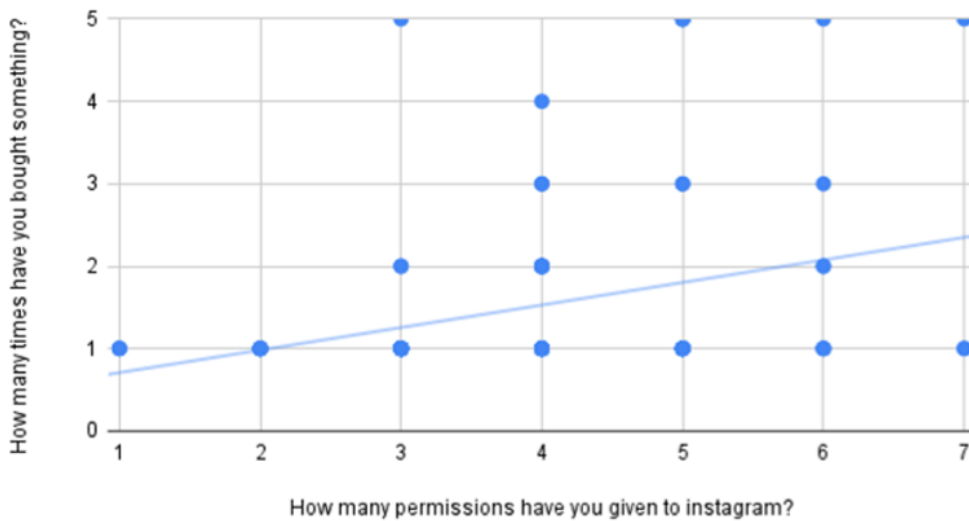


Figure 6 : Scatter graph showing correlation between access given to Instagram and how many times the users have bought something

Survey results on how well advertisements resonate with users and how many hours a day users spend on Instagram.



Figure 7: Scatter plot depicting correlation between advertisements resonating with users and how many hours a day users spend on the platform.

Survey results showing correlation between how many permissions user has allowed on Instagram and how many hours user spends on Instagram.

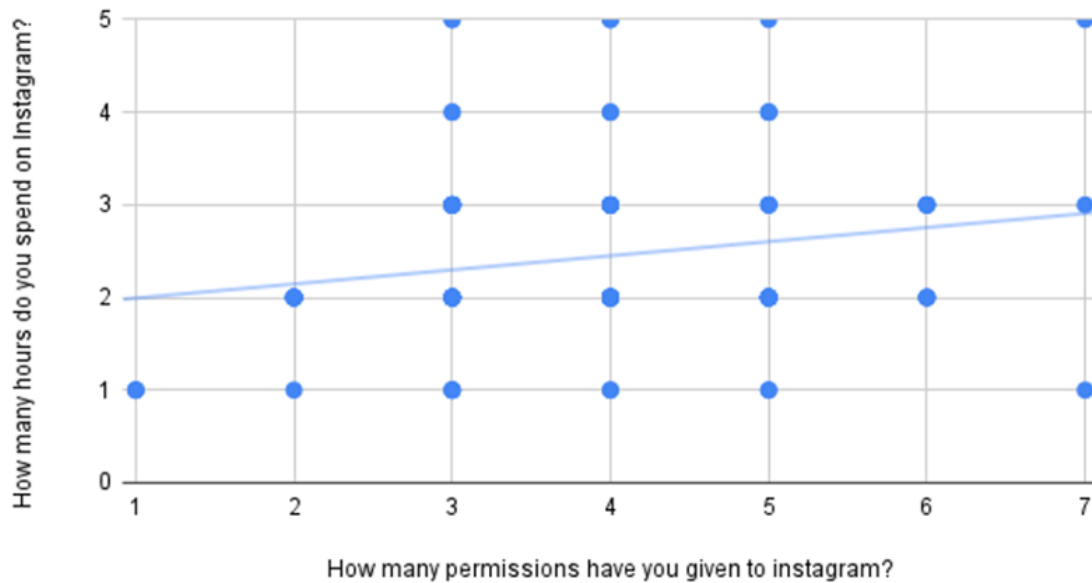


Figure 8 : Scatterplot depicting permissions given access to and hours spent on Instagram

ferences. This was expected, the more data users provide to Instagram, the more accurate their recommendations will be

based on the algorithm. This also resonated with more permissions approved, leading to more items bought through ad-

Survey results depicting how often users sign into third-party websites using their Facebook login and how many items they have bought of an Instagram advertisement or sponsored post

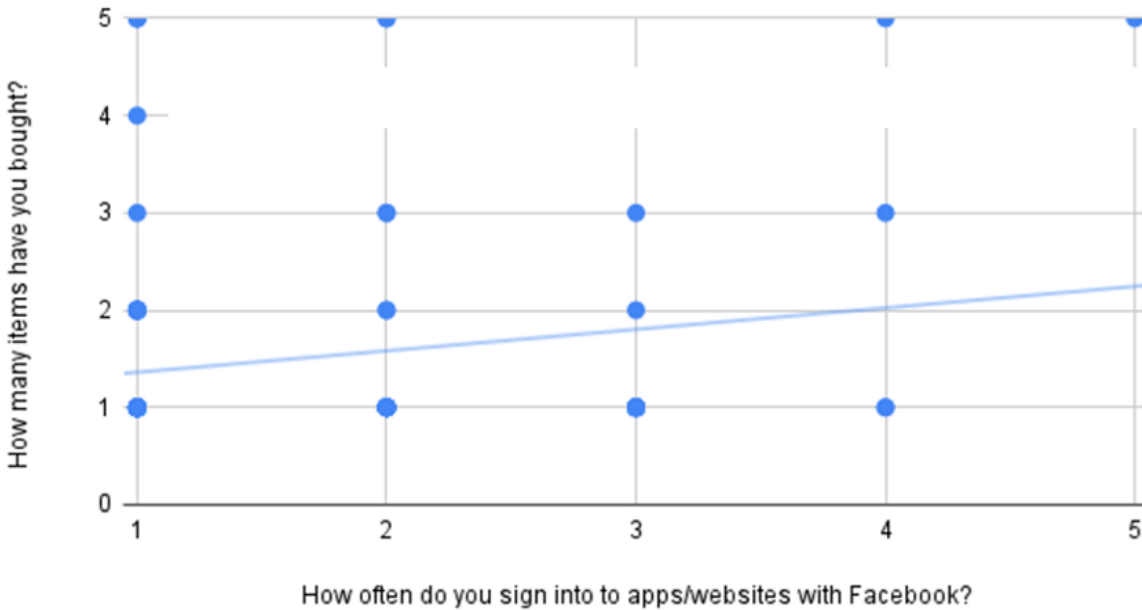


Figure 9 : Scatterplot showing correlation between how often user signs into third-party websites using Facebook and how many items user has bought on Instagram

vertisements on Instagram. This proved that the more data users approved on Instagram led to advertisements resonating with users to such an extent that they spent money on the item. Results from questions relating to spending on Instagram were more significant, as the study was done on teenagers, and due to most of them having a lack in financial freedom, they are likely to purchase items only if they resonate with the item on a high level. Figure 5 shows that the more permissions a user gives to Instagram, the more they resonate with the ads shown. Figure 6 outlines that the more permissions given the more they purchase. Therefore, it can be deduced that the information given to Instagram such as location, camera, and photos, are being used to curate advertisements to the user's taste. A major correlation was evident between the number of hours users spent on Instagram, and how much the advertisements resonated with them. The longer users spent on the app, the more they felt as if the advertisements resonated with them. This result, Figure 7, showed that Instagram studied user activity on the platform to curate advertisements suited for them. The longer you spend the more information you give on your activity. It is essentially giving the algorithm more training data. Another interesting result was the lack of a major correlation between permissions approved to Instagram, and the hours a user spent, Figure 8. The results for this were very widespread, leading to the assumption to be made that more

data access given to Instagram does not make the app more addictive. All the above correlations proved our second hypothesis. A correlation that opposed our second hypothesis was between users signing into external websites through their Facebook handle and the items bought through Instagram advertisements, as shown in Figure 9. This seemed to show that a more exposed Instagram profile did not lead to more target advertising or more spending. This result could be linked to fewer teenage users using Facebook, as shown by our survey where over 60% of users do not log in with their Facebook account, making it highly likely that they do not have a Facebook account, or could show that external websites did not impact your Instagram data profile. This study had a variety of strengths. In our research, we found some expected results, such as the more time one spends on Instagram the more relevant advertisements users are shown, the more exposed a user's profile the more products they ended up buying, and other algorithm-based discussions. However, a few other critical issues that came up in this research are the lack of awareness on the part of the teenagers as to what the terms and conditions are while they are signing up for Instagram. Past case studies and this research question the trust the users naively bestow social media websites with. Users are benefiting from more personalized advertisements; however, they do not know the backend of who accesses their data and for

purpose; this is dangerous as companies can be ruthless. Our data failed to disprove both hypotheses, which is not surprising at all. However, the lack of awareness is disconcerting, and the revelation of which is the major strength of my study. It also raises the concern that teenagers are already vulnerable when it comes to being the prey to predatory behavior online. Most social media companies practice predatory engagement, i.e., engagement comes at the cost of comprising the data of the user. It is shocking to discover that some users do not know how to stop sharing their location and revert the initial approval. The results are not only alarming but are screaming for attention. What is perturbing is the use of data is not only restricted to predatory advertising but goes much beyond that and is also accessible to law enforcement agencies, political campaigning agencies, or the Government. Users are benefiting from more personalized advertisements; however, they don't know the backend of who accesses their data and for what purpose, and as we have seen in the past, companies can be ruthless. The major strength of my study comes in through the value of results, which demonstrate how dire of a situation this is, and the clear need to build this awareness amongst teenage girls on how to responsibly share their data on Instagram so that they navigate the service safely, and possess data sovereignty while being aware of the risks involved. However, there were some limitations to this study. Self-perceived results are a possible limitation because there is high variation and bias as to how participants may consider advertisements tailored or not. Hence the study was based on user assumptions of their algorithm and awareness, which may have led to possible sample bias. In order to enhance the robustness of the analysis, objective measures and statistical analysis are critical to include. With a human sample, there are quite a few expected limitations. While our target audience was female, we did have around 25% of our responses being male. Additionally, while conducting the study and sharing the questionnaire, subconscious selection bias may have been present, as the survey was shared through social media with the respondents. Our sample was based in India, and due to normative practices, shopping through Instagram is highly unlikely in India; hence this may have restricted our results in relation to the "how many items have you bought on Instagram in the last month" question. Our study was also based on Instagram due to its high user base of teenage girls; however, as of 2022, there are at least 17 major social media platforms with more than 300 million active users each; hence results may prove to be different on different social media platforms depending on the type of social media, users, and location¹⁶. Global Social Media Statistics. Data Reportal, pp. 1-2.)). While the overturning of Roe V Wade directly impacts women in the United States, we did not have access to users in the US; hence our study is based in India to see the possible implications if a law banning abortion was to be enforced in India. The study did

not consider cultural aspects present in India, however these did subconsciously influence survey responses, limiting the generalizability of responses. Moreover, the stark differences between social media platform practices is another limitation to the generalizability of the results. Having discussed the consequential incidents with data that have taken place, i.e., Cambridge Analytica and the more recent Nebraska Facebook Abortion case, this study aimed to quantify user awareness on data in teenagers in India and discuss the ethical impacts lack of user awareness can have on women in a post-Roe V Wade era. The study started out with the intent to understand the user awareness of teenage girls around Instagram usage and has briefly outlined the perils of lack of awareness and the extent to which this is prevalent. Through this study, we discovered how severe the lack of user awareness of data usage by corporates is, and the ethical impacts it can have. With over 80% of teenage users not being aware of data usage policies and 20% not knowing how to control their privacy settings, this study has emphasized the importance of educating teenagers on safety with their data. Recommendations given were to make privacy policy terms and conditions more understandable and accessible to young users. Increased self-awareness in data privacy amongst younger generations and implementation of stricter data privacy regulations would help tackle the issue of lack of awareness. There is immense scope for future research in related fields, including but not limited to the quality and nature of ways to create awareness amongst users in relation to the appropriateness of content creation with regard to building more user awareness. It could include looking at an older age group of women to see how data privacy in the current era affects them. It could also be looked at from other countries, specifically the US, where the new abortions ban policies have been implemented. Investigating the role of cultural factors in shaping social media usage as well abortion rights should be conducted across various countries. Furthermore, to prevent biases that may arise from self-perceived responses, objective methods such as click through rates, and engagement rates should be considered. Moreover, statistical analysis measures such as propensity score matching or regression models that control for user perceptions are critical additions to reduce biases from self-perceived responses. Supplementing survey data with alternative data source would further reduce any biases present. Additionally, future work should be done on other different social media platforms, such as TikTok, another popular social media platform used primarily by teenagers, which maybe a good platform to continue this research in. A study of the practice of predatory behavior against teenage girls could be a crucial topic to be explored, along with the idea of ethics versus laws.

Appendix

1. Survey

Data Privacy and User Awareness

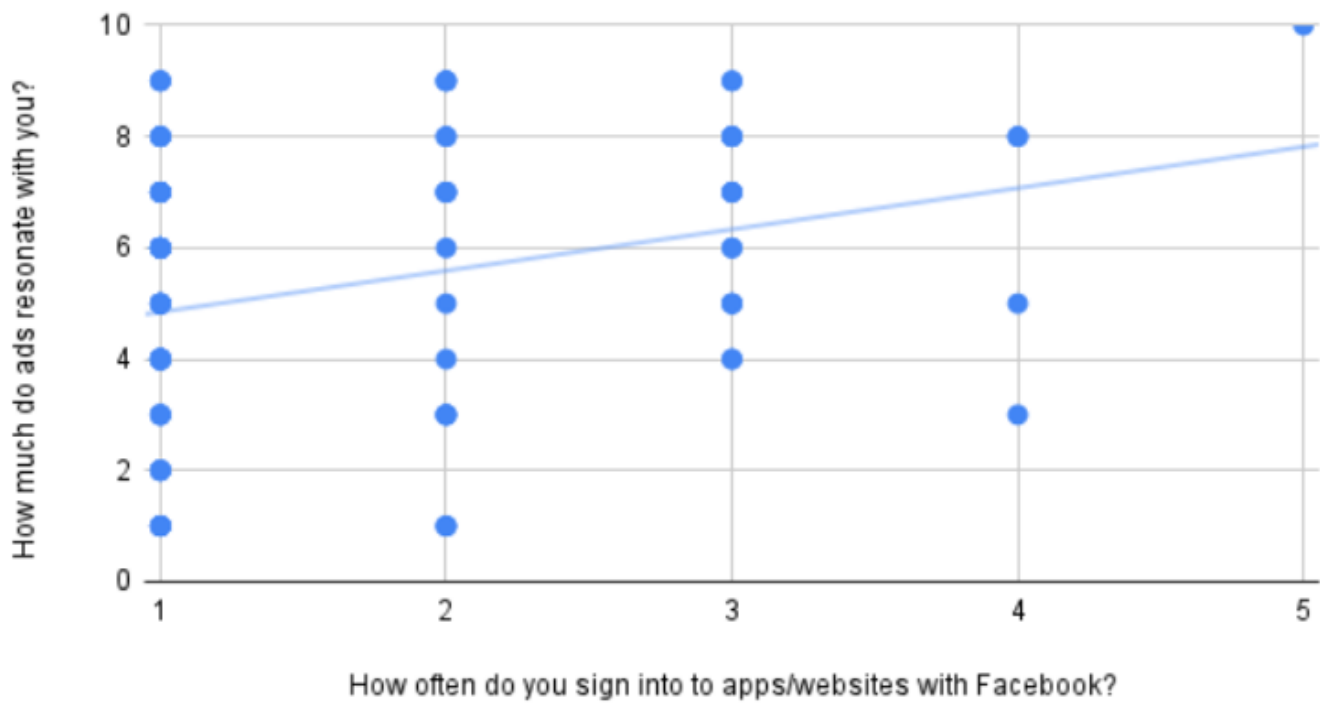
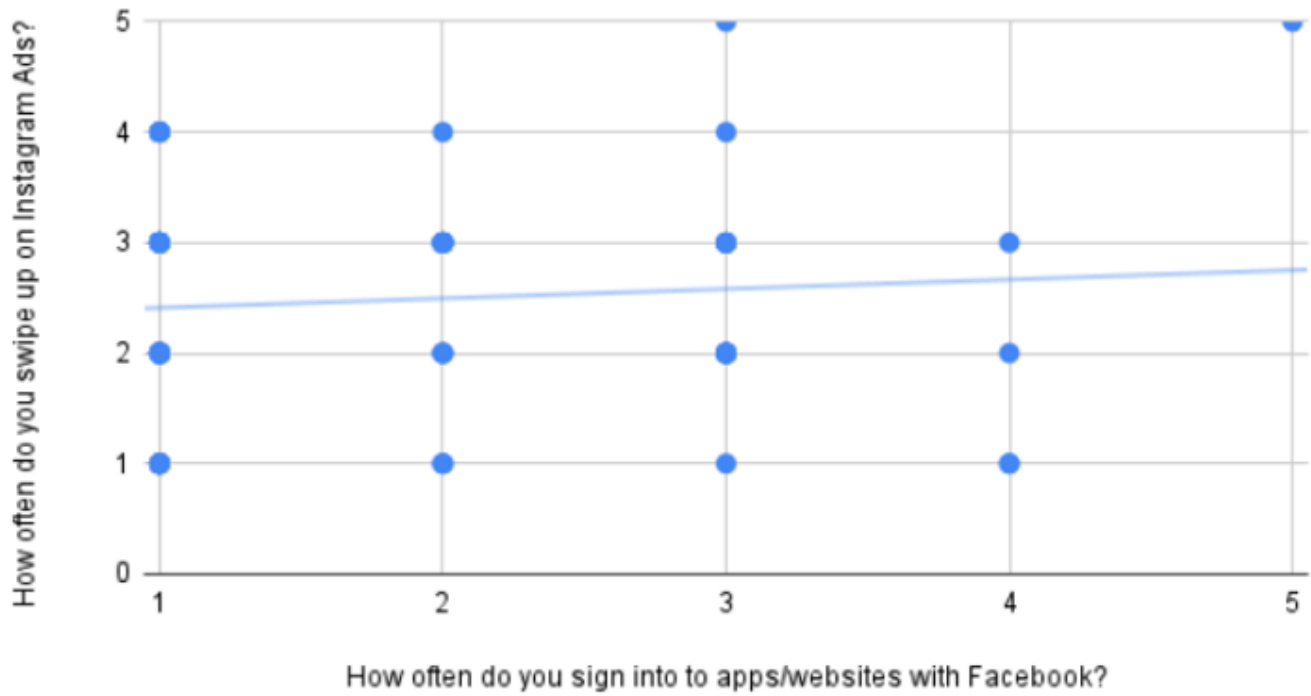
By filling out this form, you consent to allow your responses to be used in a research study. This is an anonymous response.

1. What gender do you resonate with?
2. How old are you?
3. Do you use Instagram?
4. How often do you use Instagram?
5. Before signing up for Instagram, did you read through the terms and conditions?
6. Are you aware of the contents of Instagram's terms and conditions around the usage of your data?
7. Are you aware of how to turn off certain settings, such as location settings, contact settings, etc.?
8. Are you aware of the Cambridge Analytical scandal?
9. How many permissions have you approved on Instagram? (Select all that apply)
 - Camera
 - Photos
 - Microphone
 - Contacts
 - Location
 - Local Network
 - Tracking
10. How often do you sign into apps/websites with a Facebook account? You can check this (by going to Settings, Security, Apps and websites).
11. How well do the ads you see on Instagram resonate with you?
12. How often do you click on/swipe on/visit links through the ads you see on Instagram stories or posts?
13. How many times in the past year have you bought something through an Instagram ad, recommended post, or through Instagram's shop.

2. Further results

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Are you aware of the Cambridge Analytica Scandal and its consequences?

